THE PSYCHOLOGY OF SOCIOECONOMIC INEQUALITY

IN THE UNITED STATES

by

RITA M. LUDWIG

A DISSERTATION

Presented to the Department of Psychology
and the Division of Graduate Studies of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

September 2021

DISSERTATION APPROVAL PAGE

Student: Rita M. Ludwig

Title: The Psychology of Socioeconomic Inequality in the United States

This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the Department of Psychology by:

Elliot Berkman	Chairperson
Elliot Berkman	Advisor
Sanjay Srivastava	Core Member
Robert Mauro	Core Member
Michael Kuhn	Institutional Representative

and

Andrew Karduna	Interim Vice Provost for Graduate Studies

Original approval signatures are on file with the University of Oregon Division of Graduate Studies.

Degree awarded September 2021

DISSERTATION ABSTRACT

Rita M. Ludwig

Doctor of Philosophy

Department of Psychology

September 2021

Title: The Psychology of Socioeconomic Inequality in the United States

Effective, evidence-based public policy is of critical importance to address issues of socioeconomic inequality, poverty, and class mobility. Psychological science has a valuable opportunity to inform the development of effective policy through its person-centered approach to understanding social phenomena. The core thesis of this dissertation is that the ability to design effective social welfare is dependent upon a comprehensive understanding of inequality as a systemic social phenomenon, and that psychological science can fill gaps in this understanding that are unaccounted for by traditionally dominant sociological and economic theories.

To demonstrate this, I present two novel empirical studies that link socioeconomic status and mobility to psychological factors. The first study (Chapter II) tests whether personality traits such as conscientiousness and impulsivity, discounting of distant financial rewards, and socioeconomic status are related in a sample of N= 1100 American adults with annual income ranging from at or below the poverty line ($0–$20,000) to upper-middle class ($200,000+). The second study (Chapter

III) builds on the former with a sample of $N = 313$ American adults who recorded their daily financial expenditures to test whether and how personality traits and affective experience relate to everyday purchases. I conclude with a general discussion (Chapter IV) reviewing how extant psychological theories can account for the muted successes of real-world policy, and make recommendations for those seeking to further address issues of socioeconomic inequality through research and policy initiatives.

This dissertation includes previously published co-authored material.

CURRICULUM VITAE

NAME OF AUTHOR: Rita M. Ludwig

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene
Columbia University, New York
New York University, New York

DEGREES AWARDED:

Doctor of Philosophy, 2021, University of Oregon
Master of Science, Psychology, 2015, University of Oregon
Master of Arts, Quantitative Methods in the Social Sciences, 2012, Columbia University
Bachelor of Arts, Psychology and Sociology, 2009, New York University

AREAS OF SPECIAL INTEREST:

Social psychology
Data science
Socioeconomic inequality
Poverty
Goal achievement

PROFESSIONAL EXPERIENCE:

Graduate Employee, University of Oregon, 2014-2021

Laboratory Coordinator, Harvard University, 2012-2014

Laboratory Coordinator, Columbia University, 2010-2011

GRANTS, AWARDS, AND HONORS:

Norman D. Sundberg Fellow, University of Oregon, 2018

General University Scholarship, University of Oregon, 2018

Sandra Morgen Public Impact Fellow, University of Oregon, 2017

PUBLICATIONS:

Hughes, B.T., Costello, C. K., Pearman, J., Razavi, P., Bedford-Peterson, C., Ludwig, R.M., & Srivastava, S. (2020). The Big Five Across Socioeconomic Status: Measurement Invariance, Relationships, and Age Trends. *Collabra: Psychology*, Accepted Stage 1 Registered Report. Peprint DOI: 10.31234/osf.io/4jema

Ludwig, R.M., Srivastava, S., & Berkman, E.T. (2019). Predicting exercise with a personality facet: Planfulness and goal achievement. *Psychological Science*, *30*(10), 1510-1521. DOI: https://doi.org/10.1177/0956797619868812

Dang, J., Barker, P., Baumert, A., Bentvelzen, M., Berkman, E., Buchholz, N., Buczny, J., Chen, Z., De Cristofaro, V., de Vries, L., Dewitte, S., Giacomantonio, M., Gong, R., Homan, M., Imhoff, R., Ismail, I., Jia, L., Kubiak, T., Lange, F., Li, D., Livingston, J., Ludwig, R.M., Panno, A., Pearman, J., Rassi, N., Schiöth, H. B., Schmitt, M., Sevincer, A. T., Shi, J., Stamos, A., Tan, Y., Wenzel, M., Zerhouni, O., Zhang, L., Zhang, Y., Zinkernagel, A. (2019). A multilab replication of the ego depletion effect. *Social Psychological and Personality Science*. DOI: https://doi.org/10.1177/1948550619887702

Cosme, D.*, Ludwig, R.M.*, & Berkman, E.T. (2019). Comparing two neurocognitive models of self-control *during dietary decisions. Social* Cognitive and Affective Neuroscience, nsz068. DOI: https://doi.org/10.1093/scan/nsz068

Ludwig, R.M., Flournoy, J., & Berkman, E.T. (2018). Inequality in personality and temporal discounting across socioeconomic status? Assessing the evidence. *Journal of Research in Personality*, *81*, 79-87. DOI: https://doi.org/10.1016/j.jrp.2019.05.003

Ludwig, R.M., Srivastava, S., & Berkman, E.T. (2018). Planfulness: A process-focused construct of individual differences in goal achievement. *Collabra: Psychology*, *4*(1), 28. DOI: http://doi.org/10.1525/collabra.136

ACKNOWLEDGMENTS

I would like to acknowledge all of the people whose joint efforts helped me grow from a first generation student into a doctor of psychology. First and foremost, I want to acknowledge the unconditional love and support provided to me by my family. My parents, Susan and Andrew, made personal sacrifices to ensure that I had a quality education growing up and have always been my most vocal cheerleaders. Adam was my rock, and provided an unshakable foundation as I pursued this dream across four Universities and as many cities. All sat through multiple long graduation ceremonies with proud smiles, made sure I ate something with nutritional value during intense periods of work, and always told me that I could when I was convinced that I couldn't. I wouldn't be who or where I am without you.

Realizing my lifelong dream of becoming a doctor would not have been possible without my advisor Dr. Elliot Berkman, and the additional mentorship of Dr. Sanjay Srivastava. I promise to pay forward your generosity in whatever way I can to help the next generation of scientists achieve their dreams as you have helped me achieve mine.

I was extremely lucky to enter in the doctoral program at the same time as an incredible group of people, who are among the most intelligent, most compassionate, most hilarious human beings I have ever known. Brett, Cory, Grace, and Melissa, AKA The Best Cohort Ever (with honorary members Adam and Katherine), over the past seven years

we have explored the vast space of all possible human emotions together, created many cherished memories, and grown together as a family. I am so grateful for you all, and I can't wait to see where life takes us next. I am certain that whatever we all end up doing we will take it to the limit.

My graduate school career was immensely enriched by being active in my Union, the Graduate Teaching Fellows Federation (GTFF 3544), where I met people who inspired me to never give up the fight for a better world. The solidarity that I felt with Satan's Little Helpers in particular gave me the fortitude to face uphill battles and the security to potentially fail and try again – thank you all for demonstrating to me what true compassion for other people looks like. Thank you additionally to Michael Marchman and Glenn Morris for providing their labor so that graduate students at the UO are treated fairly as workers as well as students.

Finally, I would like to acknowledge all of the following people who provided emotional support during the process of writing this dissertation and songs to my dissertation playlist — I am grateful to know you and be cared for by you: Alyssa Adkins, Youssef Benasser, Victoria Braun, Anastasia Browning, Theresa Cheng, Clarissa Cortland, Dani Cosme, Krista DeStasio, Beth Devine, Curtis Dlouhy, Michelle Dreiling, Jared Gardiner, Ellen Kress, Katie Insel, Lauren Kahn, Michelle Kuchuk, Dustin Lenz, April Lightcap, Mike Magee, Morgan Sosa, Johnny Saunders, Ryan Uhle, and Sylas Wilson.

To mom, dad, and GeGe, who taught me how to read and how to love.

TABLE OF CONTENTS

Chapter Page

Chapter Page

Chapter Page

LIST OF FIGURES

Figure Page

LIST OF TABLES

CHAPTER I
INTRODUCTION

Over 30 million Americans were already living below the poverty line in early 2020 when the COVID-19 pandemic first hit the United States. In addition to the human costs of infection, illness, and death, the pandemic brought with it repercussions to infrastructure and the economy at levels of severity unseen in modern American history. Unemployment rates in all states surpassed those of the Great Recession and climbed as high as 40% for those in service occupations (U.S. Bureau of Labor Statistics, 2020). Despite government intervention in the form of two stimulus bills (CARES Act of 2020; Consolidated Appropriations Act of 2021), some have estimated that the poverty rate has further increased by as much as 8% as a result of the COVID-19 shockwave (Parolin et al., 2020).

The stress of the pandemic exacerbated existing features of disparity in the present-day social structure of the United States. Over the course of recent decades, wealth and income inequality has increased, socioeconomic mobility has slowed, and the proportion of people living in deep poverty has grown (Brady & Parolin, 2020; Carr & Wiemers, 2016; Chetty et al., 2017; Bialik, 2016). Public policy is one tool which governments use to address issues of inequality, with the most well-known example in the United States being welfare legislation introduced by President Johnson in 1964. The effectiveness of such policies even prior to the pandemic was mixed (Meyer & Wu, 2018). Now, as a greater number of Americans find themselves relying on unemployment claims and food banks, the limits of the existing welfare programs to compensate for the precarity of a widening socioeconomic gap have been made visceral.

President Obama's 2013 declaration that increasing inequality is "the defining challenge of our time" therefore remains poignant in the

present moment of United States' history. The need for successful, scalable, and cost-efficient welfare programs has become more pressing as the country attempts to recover from the still-ongoing pandemic in 2021. Thus, the critical question arises: how can the government develop policy to meet this need?

The core thesis of this dissertation is that the ability to design effective social welfare is dependent upon a comprehensive understanding of inequality as a systemic social phenomenon, and that psychological science can fill gaps in this understanding that are unaccounted for by traditionally dominant sociological and economic theories. To demonstrate this, I present two novel empirical studies that link socioeconomic status and mobility to psychological factors. I conclude by discussing how extant psychological theories can account for the muted successes of real-world policy, and make recommendations for those seeking to further address issues of socioeconomic inequality through research and policy initiatives.

Socioeconomic Inequality

Definition & Significance. Human societies, like those of other primates, reliably establish social hierarchies wherein members of higher status in the hierarchy are treated with deference by those with lower status (Alder et al., 1994). *Socioeconomic stratification* describes how the distribution of socially-valued resources is linked to these hierarchies, such that distinguishable 'strata' of people with similar social and economic attributes form. The difference in the concentration of these resources across strata is the level of a society's *socioeconomic inequality*, and the bottom stratum is almost always occupied by people who live in state of *poverty*, that is, they lack sufficient resources to meet even their basic needs. In 2020, the top 1% of Americans owned a third of the country's entire wealth (Federal Reserve Board, 2021) while 11.7% of the population were living in poverty (Han, Meyer, & Sullivan, 2020),

indicating an extreme level of socioeconomic inequality in the United States.

Both the national levels of poverty and socioeconomic inequality are indicators of a country's overall economic health. For example, greater divides in annual household income across strata may be indicative of stagnating wages and hampered economic growth (Partridge, 2020). But these are humanitarian issues as much as they are economic ones. Those living in lower socioeconomic level households have been observed to suffer more physical and mental ailments, including increased inflammation of internal organs (Schmeer & Yoon, 2016), dysregulated cardiovascular responses to stressors (Evans & Kim, 2007), and increased likelihood of experiencing psychological distress (Reiss, 2013; Weissman, Pratt, Miller, & Parker, 2015); they are also more likely, in general, to die sooner than their peers in higher strata (Lynch, Kaplan, & Shema, 1997). As summarized by U.S. Senator Bernie Sanders in a 2011 statement, "…poverty in America today leads not only to anxiety, unhappiness, discomfort and a lack of material goods. It leads to death. Poverty in America today is a death sentence for tens and tens of thousands of our people."

Policy Solutions & Limitations. Government policy efforts to shrink income inequality are primarily targeted toward reducing the percentage of people living in poverty, to prioritize helping those who are living in an extreme state of need. Social welfare programs alleviate financial burdens or provide direct monetary incentives for people living at or below the national poverty line. For example, the Supplemental Nutritional Assistance Program (SNAP) improves poor families' access to nutritious foods by providing them with monthly stipends for groceries, while the Earned Income Tax Credit (EITC) provides monetary bonuses to poor families once a year. These programs have had notable successes: the U.S. Census Bureau's Supplemental Poverty Measure estimates that the number of individuals living in poverty was reduced by 14 percentage

points due to welfare in 2016, and other sources report that poverty rates decreased by over a third during the time between the Johnson administration's expansion of the social safety net and the end of President Obama's second term (Wimer, Fox, Garfinkel, Kaushal, & Waldfogel, 2013).

There have also been noted challenges faced by these programs in recent U.S. history. For example, government expenditures on implementing programs that primarily benefit lower-income Americans have been decreasing since the Great Recession (Examining the Safety Net, 2015), and some programs have struggled to reach their the target populations — in 2016, less than half of the people eligible for receiving food assistance or tax credit benefits reported enrolling (Burton, Mattingly, Pedroza, & Welsh, 2017). These challenges are often magnified in the public eye by Republican party politicians, whose calls for cuts to welfare program funding are in opposition to the expansions typically supported by members of the Democrat party (Pew Research Center, 2019). As the *Washington Post* reported in 2017, "[m]any conservatives have long argued for cutting and changing social safety net programs, arguing that anti-poverty programs have failed and that Social Security spending is growing at an unsustainable rate."

Despite these historic challenges and conservative pessimism, severe levels of socioeconomic inequality and poverty are not such intractable problems that they cannot be successfully addressed with policy. Nelson Mandela famously said, "Like slavery and apartheid, poverty is not natural. It is man-made and can be overcome and eradicated by the actions of human beings". The better our understanding of the forces driving the trend of increasing national levels of socioeconomic inequality and poverty, the more clear it will become what actions can be taken to stop it.

Overview of the Dissertation

The goal of this dissertation is to improve scientific understanding of the level of socioeconomic inequality observed in the modern United States. I report the results of two empirical studies exploring how the variance of psychological factors across socioeconomic strata can inform theories of socioeconomic mobility. I then conclude with a discussion of factors identified in the novel work which may explain why existing social welfare policies have struggled to succeed, in hopes that future programs may avoid being similarly limited.

Study 1. The United States is culturally known as the "land of opportunity", a casteless society wherein all people are given equal opportunity to be the engineers of their own achieved successes. A related belief is that socioeconomic mobility is driven in part by the degree to which individuals are oriented towards achieving long-term financial goals. This study tests whether personality traits such as conscientiousness and impulsivity, discounting of distant financial rewards, and socioeconomic status are related. N = 1100 American adults with annual income ranging from at or below the poverty line ($0–$20,000) to upper-middle class ($200,000+) were sampled and associations among variables were analyzed in a series of structural equation models. Implications for theories of social mobility are discussed.

Study 2. Research in psychology and economics has established a link between socioeconomic status and the psychology of financial decision-making. Specifically, lower SES has been associated with an increased preference for immediately available, smaller monetary incentives over future larger ones, and a decreased propensity for long-term planning of goals. While these group-level patterns have been observed, the factors contributing to financial decision-making at an individual level are still not yet well understood. The present research illuminates these factors by asking poor and middle-class participants

(*N*=315) to complete daily diaries to understand how they think about their daily expenditures and general financial standing. Participants were asked to record the amount, category, and associated emotional experience of each expenditure made over the course of one month. We find select dissociable trends in both spending behaviors and the affective experience of this spending by socioeconomic class and personality traits.

General Discussion. Having demonstrated the relevance of psychological factors to issues of poverty and socioeconomic inequality, this chapter turns to a broader discussion of how the field of psychological science can contribute to welfare policy development. It presents a literature review of psychological theories and research that can account for noted limitations of existing programs. It concludes with recommendations for addressing socioeconomic inequality with future research and policy.

Notes. This dissertation contains both published and unpublished co-authored material. Study 1 (described in Chapter III) is published in the *Journal of Research in Personality* and was coauthored by J. C. Flournoy and E. T. Berkman. Study 2 (described in Chapter IV) is coauthored by C. Dlouhy and E. T. Berkman.

The content in this dissertation is circumscribed to socioeconomic inequality in the United States of America, as that is the population which subjects were overwhelmingly sampled from in the discussed empirical literature. Unless otherwise noted, conclusions are to be interpreted as U.S.-specific.

CHAPTER II

STUDY 1: INEQUALITY IN PERSONALITY AND TEMPORAL DISCOUNTING ACROSS SOCIOECONOMIC STATUS? ASSESSING THE EVIDENCE.

This chapter is published in the *Journal of Research in Personality* and is therefore formatted according to the journal's publication standard–the American Psychological Association style manual. It was co-authored by J. C. Flournoy and E. T. Berkman. I lead all aspects of this project, including study design, data collection, data analysis, and writing the first draft of the manuscript. My co-authors provided input at each stage of the project, and contributed edits to all versions of the manuscript, including those in the final version accepted for publication.

Introduction

In his 1964 State of the Union Address, President Lyndon B. Johnson famously introduced a new legislative plan for the United States by boldly stating, "[t]his administration today, here and now, declares unconditional war on poverty in America." Propelled by the national outcry against widening inequality in America by the Civil Rights and feminist movements of the 1960s, this address signaled the national recognition that systemic inequality was a problem that could not be alleviated without intervention from the highest level of government. President Johnson used this speech to present his plan for transforming the country into a "Great Society," one in which poverty was eliminated and inequality was severely reduced. Now, over fifty years since Johnson's historic declaration, data suggests that the United States remains an unequal society. Since 2013, the U.S. has had one of the highest rates of inequality among developed nations (OECD, 2018), and intergenerational analyses reveal trends of increased inequality and

decreased class mobility for recent generations of Americans (Carr & Wiemers, 2016; Chetty et al., 2017). Finally, 12.7% of Americans – over 40 million people – were living below the poverty line as of 2016 (U.S. Census Bureau).

A critical question about the reality of inequality is whether and how the psychology of people living in difference socioeconomic classes might differ. Specifically, it is relevant to public policy to whether and how inequality relates to cognition and personality – both in realityand in commonly held lay theories. The present research seeks to establish whether individual differences in personality traits related to decision-making are related to socioeconomic class.

The overarching aim of this line of work is to contribute to a broader conversation about finding solutions to reduce national inequality.

Theories of How Inequality Relates to Decision-Making and Personality. Poverty is perhaps the most salient component of a society's level of inequality. Those who are poor struggle to attain what are considered to be the basic necessities of food, housing, and clothing, while quality of life resources such as healthcare or higher education are often completely inaccessible. In a hierarchical social structure, those who live in poverty comprise thelowest socioeconomic class due to their lack of wealth or power over resources. Various theoretical models have offered predictions that individual differences in personality and decision-making are asymmetrical across socioeconomic class. We focus here on two that assume systematic differences in traits and decision-making preferences between those living above and below the poverty line. The first focuses on lay perceptions of poverty – how people think about people living in poverty – and the second on how and why people living in poverty actually make certain decisions.

The "just world" theory holds that people believe individuals

deserve their place in the hierarchical social structure. In terms of lay attributions, this theory suggests that people assume that poverty is self-inflicted – presumably through attributes of the person such as traits, behaviors, and patterns of choice. Lerner (1980) describes this assumption as the (not necessarily accurate) belief that the world is fair and therefore that individuals are afforded prestige and power based on their personal qualities. This hypothesis predicts that beliefs about the traits of poor people will be primarily negative. Indeed, previous work has found that those who believed in a just world were more likely to report negative perceptions of poor people (Cozzarelli, Wilkinson, & Tagler, 2002; Furnham & Gunter, 1984). The poor are also believed to have fewer positive qualities, such as intelligence, honesty, and competency than those with higher social status (Lott, 2012; Mattan, Kubota, and Cloutier, 2017; Varnum, 2013). Consistent with the just-world hypothesis, people in these studies seem to make the assumption that negative personal characteristics (e.g., lack of conscientiousness and/or impulse control) cause decisions that lead to long-term poverty and inequality. These studies that support the presence of a just world hypothesis suggest that many people hold the belief that psychological attributes (traits, decision-making patterns) cause poverty.

A different theory flips the causal direction. In this class of ideas, the situational aspects of living in poverty produce sub-optimal behaviors and decision-making. Shah, Mullainathan, and Shafir (2012) formalized the theory of the 'scarcity mindset' to explain how living in an impoverished environment taxes cognitive abilities and biases decision-making. In a series of studies, these authors found that resource scarcity related to a narrow focus on a current task at the expense of considering future costs or benefits, and that scarcity impeded performance on cognitive tasks. Interestingly, this pattern held regardless of whether scarcity was experimentally induced or observed within subjects experiencing naturalistic variations in resources such as farmers before

and after an annual harvest (Mani, Mullainathan, Shafir, & Zhao, 2013). Financial decisions that impede class mobility such as taking out high-interest loans or forgoing bill payments and incurring late fees are common among poor people and, in this model, are thought to stem from the effects of scarcity that are associated with poverty.

A limitation of the current psychological work on inequality is that *beliefs about* the effects of poverty are rarely if ever directly compared to the actual *reality of poverty*. For example, research supporting the just world hypothesis reveals that people tend to believe poor people exhibit certain types of financial decision-making or hold particular levels of conscientiousness, and the scarcity mindset theory predicts that these patterns exist due to the nature of poverty itself, but neither of these predictions have been juxtaposed with direct observations of the relation between socioeconomic class, decisions, and personality. Both perspectives assume that the relation between personality traits and patterns of decision-making will be different among the poor than in other groups, but this remains untested. A comparison across socioeconomic class may reveal whether those living in poverty do, in fact, exhibit distinct patterns of responses from those in other classes. Importantly, any documentation of such differences will contain no causal information. Instead, the value of the present research lies in revealing the degree to which individual differences are related to class inequality, not just to form a substantive base for causal theories, but also to more clearly understand the nature of inequality in order to develop effective interventions for reducing it. For example, it is possible that the 'scarcity mindset' phenomenon reliably alters financial decision-making, but is not strong enough on its own to cause the stable economic differences across socioeconomic classes.

Aim of the Present Study. The present research speaks directly to assumptions about how those at the lowest level of socioeconomic status tend to make decisions, and whether these patterns are different

than those individuals in higher socioeconomic classes. Specifically, the present research tests the assumption that members of the lowest socioeconomic class exhibit traits and behaviors thought to be inconsistent with class mobility. To study this possibility, an online survey was distributed to 1,100 participants across the United States whose annual income ranged from less than $10,000 to more than $200,000. This survey included several different measures of personality and socioeconomic class as well as a financial decision-making task.

Consistent with prior work, this paper uses the term 'socioeconomic class' to describe a higher order construct that represents "an individual or group's relative position in an economic- social-cultural hierarchy" (Diemer et al., 2013). There are two subordinate constructs to this conceptualization of socioeconomic class: *socioeconomic status*, which refers to the individual or group's objective prestige and power over resources as afforded by the position in that hierarchy, and *subjective social status*, which represents the perception of one's own social class at the individual level. This paper focuses on socioeconomic status as it is a more objective measurement.

Three primary hypotheses were specified *a priori* to examine the relationships between socioeconomic class and personality and decision-making, in line with the discussed theories' predictions:

1. Greater socioeconomic status will relate to making decisions that favor long-term gains over short-term ones.
2. Greater socioeconomic status will relate to increased valuation of long-term financial gains.
3. Socioeconomic status will be negatively related to trait impulsivity and positively related to conscientiousness and planfulness.

The present research advances research on inequality because it addresses two limitations in the current literature. First, to increase ecological validity, socioeconomic class was not manipulated experimentally in an otherwise homogeneous group but instead

measured as it occurs in people's lives. Second, to guarantee sufficient representation of low-income individuals, participants were sampled equally across income brackets. One limitation of measuring naturally occurring socioeconomic class is that we cannot infer causation. As such, we emphasize that the present research makes no causal claim about socioeconomic class and any observed trends in psychological variables. Instead, our purpose is to reveal whether such trends are observable at all.

Method

Participants and Procedure. A national sample of participants was recruited using Qualtrics panels. Participants were eligible to enroll in the study if they were 18 years of age or older, currently lived in the United States, and were native English speakers. This sample was collected based on an a priori power analysis indicating that a sample size of $N = 1{,}073$ is required to detect a small ($r = 0.1$) relationship among personality, temporal discounting, and socioeconomic status with 90% power. The sample was additionally drawn to be roughly equivalent across annual income brackets. Specifically, 160 people were recruited for each annual income bracket of $0 - $25,000 and $26,000 - $50,00; 153 people were included for the $51,000 - $75,000 bracket; and 150 people were included for each income bracket of $76,000 - 100,000, $101,000 - $150,000, $151,000 - $200,000, and greater than $201,000 annually. These brackets were selected based on the 2016 poverty threshold ($24,339 for a household of two adults and two children) and median income ($57,617 for all households) (U.S. Census Bureau). Notably, participants were *not* recruited at income rates proportionate to those at the national level; this was intentional, as it allowed us to include more individuals living below the poverty line, who are typically undersampled in psychological research (Henrich, Heine, & Norenzayan, 2010). This sample therefore represents individuals across all

socioeconomic classes except the hyper-wealthy and permits us to draw inferences about the decision-making and traits of individuals across class.

Qualtrics distributed the survey to participants based on their eligibility and the targeted income brackets. Participants received the invitation to the Qualtrics survey link, where they were greeted with an online consent form. After again confirming their eligibility to participate and their consent, participants proceeded to the online survey. As a quality assurance step, Qualtrics distributes the survey to 10% of the total requested sample size as part of a "soft launch". The responses from the soft launch are used to detect any quality control issues with the survey, including fast responding that might reflect lack of engagement with survey items; if soft launch responses are not removed by Qualtrics due to quality control issues, they are included in the final full dataset. If participants in the remainder of the sample respond faster than one third of the median response time from the soft launch sample then their survey session is terminated and their data are not recorded. None of the recorded data had been viewed, cleaned, or altered in any way from its raw form prior to the submission of this registered report.

Materials. A variety of personality trait and socioeconomic class measures were presented to participants, as well as a financial decision-making task. The survey first presented the demographic questions and the financial decision-making task in a fixed order, followed by the personality questionnaires and measures of social class in a randomized order. The entire survey took on average 30 minutes to complete.

Financial Decision-making Task. Temporal discounting describes an individual's preference for receiving smaller rewards in the present over larger ones in the future, reflecting the degree to which a person discounts the value of a future reward. Previous work suggests that temporal discounting is related to impulsivity, and may be related to financial mismanagement (Hamilton & Potenza, 2012). The hypothesis

that those living in poverty exhibit more extreme temporal discounting is tested here with the Convex Time Budget Task (CTB; Andreoni, Kuhn, & Sprenger, 2015). In this task, on each item participants choose among six economic reward options varying across two different time frames (one sooner and one later). There are four different pairs of time frames with six reward options each, for a total of 24 decision items total to be made in this task (see Appendix A for an example item). This measure is unique in the number of options it presents the participant with compared to other measures of temporal discounting, which typically present only two options (Frye, Galizio, Friedel, DeHart, & Odum 2016; Richards, Zhang, Mitchell, & de Wit, 1999). For example, in a typical temporal discounting task a participant might be asked to choose between the two options, "$19 today and $0 in 5 weeks" and "$0 today and $20 in 5 weeks," whereas the CTB adds four intermittent options such as "$11.40 today and $8.50 in 5 weeks" and "$3.80 today and $16.00 in 5 weeks." Compared to two-option tasks, the CTB provides more robust measurements of time discounting parameters,which is why it was selected for our research (Andreoni, Kuhn, & Sprenger, 2015).

Measures of Socioeconomic Status. To measure socioeconomic status we collected self-reported household income and the number of people living in the respondents' permanent residence. Participants indicated theirhousehold income by selecting one of several brackets: "10,000 or less"; "10,000 - 19,999; 20,000 – 29,999", etc. in brackets of ~$10,000 per level up to $199,999; from $200,000 to $499,999 in brackets of ~$50,000; $500,00-$999,999; and $1,000,000 or more. Number of people living in the household was indicated using a numerical scale from 1-20. To be clear, thissurvey item was distinct from the income sample parameters used for data collection, which was monitored internally by Qualtrics and not provided to the research team for analysis.

Personality Measures. Each measure was included to assess characteristics thought to relate to class mobility and long-term financial goal achievement. Our target personality traits are conscientiousness, a trait that explains variance in a person's tendency to be organized and hard-working, planfulness, a trait that explains the tendency to think about and plan future goals, and impulsivity, a trait that describes a person's tendency to act immediately on emergent urges. Specifically, the just world theory suggests that people believe conscientiousness and planfulnessto be related to class inequality, while the theory of scarcity mindset suggests that lack of access to resources causes short-term-focus, an aspect of impulsiveness, that reinforces class status. The measures included in the survey therefore are: the Barratt Impulsiveness Scale (BIS, 30 items; Patton, Stanford & Barratt, 1995), the Conscientiousness scale from the Big Five Inventory (BFI,44 items; John & Srivastava, 1999), and the Planfulness Scale (30 items; Ludwig, Srivastava, & Berkman, 2017). Responses to the BFI and Planfulness Scale used a five-point Likert scale (1=*Strongly disagree;* 3=*Neither disagree nor agree*; 5 = *Strongly agree*), while responses to the BIS were coded using a four-point scale (1=*Rarely/never*, 2=*Occasionally*, 3=*Often*, 4=*Almost Always/Always*).

Statistical Analysis. Our hypotheses focus on SES, which is operationalized as Income-to-Needs Ratio (INR) and derived from the measures described above. To calculate INR, we first calculated "adjusted household income" based on the self-reported household income item. The adjustment is to placeparticipants in the middle of the bracket that they selected (so, $15,000 if they responded "10,000 - 19,999"; $750,000 if they responded "$500,00 - $999,999", etc.). This compensates for having brackets instead of exact figures by pulling all responses together in the center values. Then INR is calculated by dividing adjusted household income by the U.S. Census poverty threshold for a household of the participants' size and age. We used the 2016 U.S. Census poverty

thresholds for reference because they are the most recently published thresholds at the time of this writing. We used this variable because it allows us to more precisely characterize participants' socioeconomic status by adjusting for household size and composition. Additionally, this variable is easily interpretable – those with an INR greater than 1 are living above the poverty line, and those with an INR of 1 or lower are living below it.

Our primary criterion variables are the scales for each of the personality measures and two parameters from the time discounting task. Measurement models for the personality traits are specified based on their original published descriptions. We will confirm that loadings are invariant across income categories, and perform all analyses using the latent personality variables. This method best accounts for measurement error and differences in how people use the scales. The temporal discounting task yields two parameters relevant to our research question: *δ (delta)* represents a participant's *temporal discounting rate* (i.e., their tolerance for waiting for rewards), and *β (beta)* represents a participant's *present bias* (i.e., the additional amount they discount future rewards if the sooner reward is received *today*). We extract these parameters using the regression model proposed in Andreoni, Kuhn, and Sprenger, (2015). Specifically, *beta* and *delta* are estimated using the following non-linear regression equation:

$$x_t = \frac{20(\beta^{t_0}\delta^k P)^{\frac{1}{\alpha-1}}}{1 + P(\beta^{t_0}\delta^k P)^{\frac{1}{\alpha-1}}}$$

where x_t is the amount chosen by the participant to receive as soon as possible (that is, at some time, *t*, before the delayed amount), 20 is the maximum payout amount possible at time $t + k$, *beta* is the amount of bias toward the present (that is, a multiplier on the discounting rate when time t = today, in which case $t_0 = 1$, and otherwise 0), *delta* is the discounting rate, *k* is amount of time between the sooner and later

options, P is the interest rate (such that $P \cdot x_t + x_{t+k} = 20$, which describes that when interest rates are higher, sooner rewards, x_t, are lower than delayed rewards, x_{t+k}), and *a (alpha)* governs the curvature of the utility function (such that lower values result in amore gradually varying sensitivity to differences in delay or interest rate).

We used a regularization procedure, which leverages information from the whole sampleto increase the robustness of the person-level temporal discounting parameters. This began with estimating the CTB model coefficients using a non-linear mixed effects (NLME) model using the nlme package (Pinheiro J, Bates D, DebRoy S, Sarkar D and R Core Team, 2018) in R (version 3.4.4; R Core Team, 2018), allowing the coefficients for *alpha*, *beta*, and *delta* to vary by participant. We then extracted the individual participant coefficient estimates from this model to use in subsequent analyses. The advantage of this approach, rather then estimating a model separately for each participant, is that by pooling information across participants one is able to overcome convergence problems and obtain estimated coefficients for participants with noisy data. This also serves to "shrink" the estimates for participants with noisy data toward the mean of the sample and in doing some provides some regularization. Optimization of the NLME model may be aided by providing the nlme function a list of non-linear regression models fit to each participant's individual data using nls (in the base-R stats package). The model fit using these random effect starting values is compared to a model fit starting with default values (to ensure that this step does improve model quality). We are then able to extract the individual coefficient estimates for all model parameters.

This step also provides an opportunity to note which participants' models do not converge without the partial pooling of information in the NLME model, and to explore data- quality issues that may cause this non-convergence. Before estimating any relations between variables, we examined these participants' data for behavior that shows a clear

departure from model-expectations. Possible reasons for non-convergence, *a priori*, might include always choosing the sooner (or later) option, choosing inconsistently (e.g., choosing both $19 and $17 today, but waiting 5 weeks for a total of $18.40), or choosing randomly. Some participants may need to be removed from the NLME model if their data departs excessively from expectations (though fewer participants will be lost than if we used only non-linear regression models). If a large proportion (> 20%) of participants must be excluded to obtain convergence of the NLME model, then this will be interpreted as an indication of severe model misspecification or data quality problems. In that case, subsequent analyses will focus on the remaining personality and SES measures, and exploratory descriptions of behavior on the discounting questionnaire.

Indeed, strong departures from model expectations may be interesting in themselves. We examined the relation between membership in "converging" and "non-converging" groups with socioeconomic and personality variables. We consider this an exploratory analysis, although greater non-convergence for lower SES participants may be consistent with both the lay Just World theory and Scarcity Mindset theory.

To test our three hypotheses of interest we have run three separate reflective structural equation models. The first two models break out aspects of time discounting into the two parameters of future bias and patience, and the third model offers a more holistic test of the construct of time discounting.

1. The hypothesis about the relation of SES to the relative value of immediate gains was tested with the significance test on the covariance between *beta* and INR. *Delta,* planfulness, Conscientiousness, and Impulsivity scale scores were included in the model as covariates. We expected smaller *beta* values to be

associated with lower INR[1].

2. The hypothesis about the relation of SES to the value of long-term gains was tested with the significance test on the covariance between *delta* and INR. Planfulness, Conscientiousness, and Impulsivity scale scores were included in the model as covariates. We expected smaller *delta* values to be associated with lower INR[2].
3. The hypothesis about the relation of SES to personality traits was tested by regressing INR on Planfulness, Conscientiousness, and Impulsivity in a single regression model. We expected higher Planfulness, and Conscientiousness, and lower Impulsivity, to be associated with higher INR.

Given the directional nature of our hypotheses, tests of the variable coefficients were one-tailed and evaluated at the .05 level. Results are interpreted according to the sign and significance of the regression coefficients. A significant coefficient *p* value will be taken to indicate the improvement of model fit to the data, and the value of that coefficient to describe how it is related to other variables in the model. Given the high power of this sample to detect small effects, variables with coefficients that do not reach statistical significance are interpreted as being unassociated with socioeconomic status.

In addition to the three regression models tested, a full reporting of the zero-order correlations among all collected variables are reported for descriptive purposes, however no conclusions are drawn from these correlations alone.

If participants missed greater than or equal to 50% of items on a personality scale, they were coded as missing a score for that scale and not included in analyses involving that scale. Due to the nature of the

[1] Smaller *beta* values indicated more present-bias. The results below use a reverse-coded version of this parameter to clarify interpretation.
[2] Smaller *delta* values indicated more temporal discounting. The results below use a reverse-coded version of this parameter to clarify interpretation.

CTB task, participants who missed more than one item per timeframe pair are coded as missing and excluded from analysis. Finally, participants who did not self- report household income are excluded from analysis.

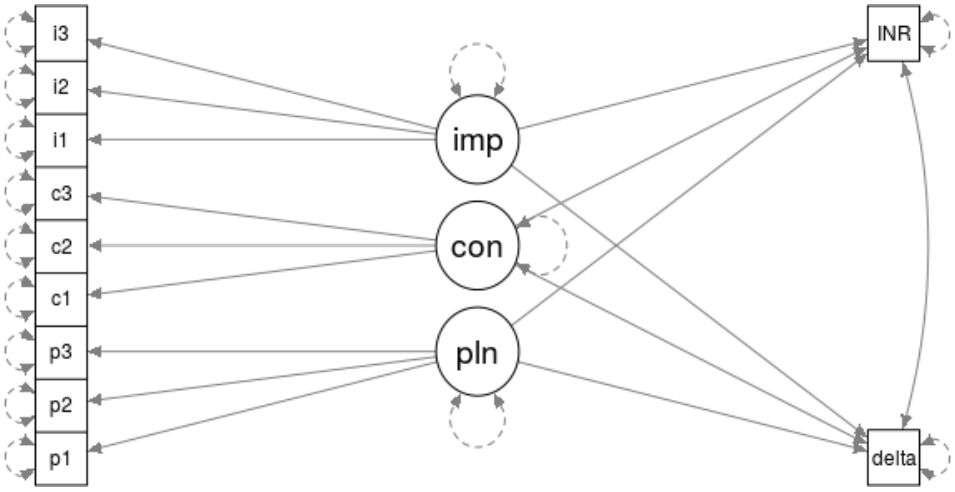

Figure 1. Example model of relationships to be tested among variables of interest. In this model, the correlation between income-to-needs ratio (INR) and an extracted temporal discounting parameter (delta) is observed, accounting for personality factors of impulsivity (I), conscientiousness (c), and planfulness (P).

Results.

Descriptives and Correlations. Table 1 contains a summary of the descriptive statistics for all of our collected measures. Of particular note is income-to-needs ratio, which ranged from 0.15 to 60.07 in our sample (M = 6.18, SD = 5.97, *median* = 4.53), and the distribution of which was right-skewed. Seventy-nine participants in our sample reported annual incomes that place them at or below the poverty threshold for their household composition and size (INR <= 1; n = 131 <= 1.5).

Separately, we also note that we have reversed the signs of all reported beta and delta parameter coefficients to aid with interpretability;

as these variables increase toward 1, they indicate *less* discounting of future rewards and present bias, hence our decision to reverse the signs to align with the natural interpretation that larger values indicate *more* of something. For the reversed variables, a value of -1 indicates insensitivity to the delay period (for *delta*) or to the immediacy of the sooner reward (*beta*). Reverse-coded variables increase from -1 toward 0 as individuals discount more with increased delay, or as they discount especially so for immediate, sooner rewards. Values less than -1 are also possible[3].

Table 2 presents the bivariate correlations among our variables of interest. We present these results for descriptive purposes and rely on our formal model tests to infer conclusions about the relationships among these variables exhibited in the data.

Table 1

Descriptive statistics of measured variables

	n	Mean	Standard deviation	Observed range
Planfulness	1,095	3.61	0.49	1.7 - 4.93
BIS	1,096	1.98	0.38	1.1 - 3.57
Consci	1,095	3.54	0.31	2.25 - 4.66
INR	1,038	6.18	5.97	0.15 - 60.07
beta	1,079	-0.92	0.12	-0.57 - -1.23
delta	1,079	-0.98	0.02	-0.94 - -1.01

Note. BIS = Barratt Impulsiveness Scale, INR = income-to-needs ratio.

Measurement Invariance. We tested for invariance of factor loadings (metric invariance) for each personality scale latent variable across income brackets; substantive inferences with respect to factor covariances can be made if the test of metric invariance is satisfied

[3] Note that the hypotheses described in the introduction are in terms of the *raw* parameters, not the reverse-coded parameters. Thus we expected *bigger* values of the *reverse coded* parameters to associated with lower INR.

(Gregorich, 2006). To check for invariance, we compared the fit of structural models of personality traits with indicator loadings constrained to equality across income groups to the fit of parallel models with indicator loadings allowed to vary by income group. The primary criterion for rejecting invariance was a difference in the McDonald fit index (ΔMFI) of < -.012, indicating much poorer fit of the constrained model. We also report differences in root mean square error of approximation (ΔRMSEA), and the comparative fit index (ΔCFI). Our results indicated that metric invariance did not hold for the Conscientiousness measure, Δ*MFI* = -0.019, Δ*CFI* = -0.016, Δ*RMSEA* = -0.009. Further inspection of the modification indices suggested that this was due to items 3 ("[d]oes a thorough job,") and 13 ("[i]s a reliable worker"). Removal of these two items resulted in acceptable fit decrement when constraining loadings to be equal across income brackets (Δ*MFI* = -0.005, Δ*CFI* = -0.006, Δ*RMSEA* = -0.016). Thus, we included an additional test for all of our models using the modified-to-be-invariant Conscientiousness scale in order to examine the sensitivity of our results to measurement quality. We found that across all of our hypothesis tests, the modified model results were consistent with the original models and therefore only report the latter below.

Table 2
Correlation matrix of measured variables.

		1	2	3	4	5
1	Planfulness					
2	BIS	**-.72**				
3	Conscientiousnes	**.38**	**-.30**			
4	INR	**.22**	**-.19**	.05		
5	beta	.07	-.05	.02	**.09**	
6	delta	.04	-.01	.00	.06	**.77**

Note: **Bolded** values are significant at $p < .05$.

Hypotheses Testing. To test our first hypothesis (socioeconomic status and immediate gains), we built a model testing the covariance between *beta* and INR, with *delta* and the personality traits included as covariates (see Figure 2A). Results showed that there was a statistically significant negative covariance between INR and a willingness to give up even more of a future reward if the sooner reward is obtained today (controlling for a person's overall discounting, *delta*, and the personality variables), b = -.03, β = -.06, p = .026. People with a lower INR showed more of a present bias. On an exploratory basis, we further examined the relationship among *beta*, *delta*, and INR with the measured personality traits, though we highlight that these coefficients were not the target of any of our *a priori* hypotheses. *Delta* was found to significantly positively correlate with *beta* (as would be expected if people who value sooner rewards also tend to value them especially so if they are obtained today), b = 4.20, β = .77, p < .001; see Table 3. INR was found to be significantly and positively related to planfulness, b = 7.14, β = .18, p < .001, which corresponds in standardized terms to roughly a whole standard deviation of INR for each half- standard deviation increase in planfulness score. INR also significantly and negatively related to impulsivity, b = -1.57, β = -.10, p = .002, corresponding to roughly two-thirds of a standard deviation increase in INR for each third of a standard deviation decrease in BIS score; see Table 3.

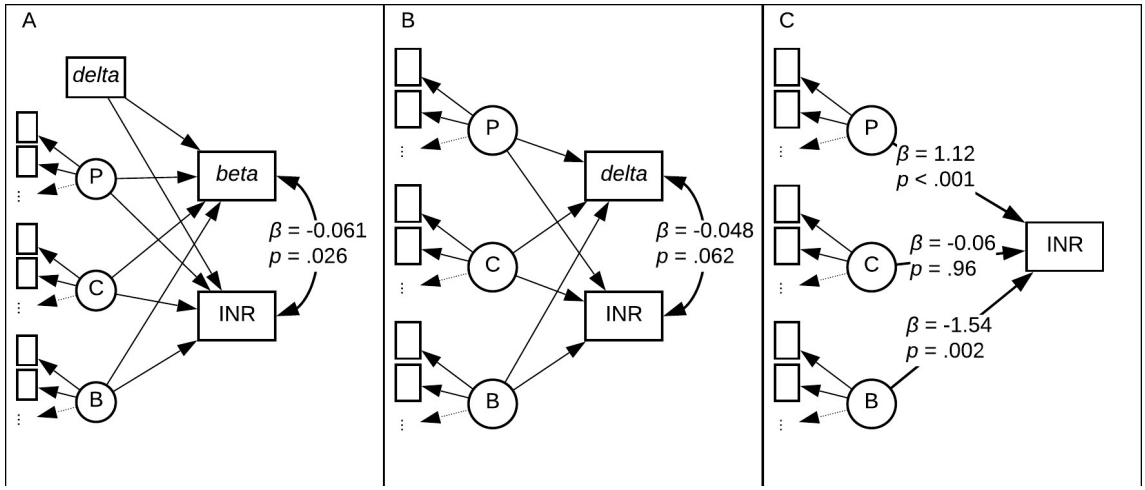

Figure 2. Labeled paths correspond to registered hypothesis tests. Coefficient βs are standardized; *p*-values are one-sided. Latent variables are denoted by circles; observed variables are denoted by rectangles. Dotted lines and arrows indicate that latent factors load on more than just the two illustrated observed variables. P = Planfulness; C = Conscientiousness; B = Behavioral Inhibition Scale. Residual variances not shown.

Table 3

Exploratory linear regressions on beta parameter and INR

	b	SE	β	p
beta parameter				
delta parameter	4.20	0.11	0.77	< 0.001
Planfulness	0.02	0.02	0.03	0.22
Conscientiousness	0	0.01	-0.01	0.64
BIS	-0.01	0.01	-0.03	0.15
INR				
delta parameter	13.17	8.3	0.05	0.11
Planfulness	7.14	1.94	0.18	< 0.001
Conscientiousness	-0.7	0.42	-0.06	0.01
BIS	-1.57	0.52	-0.10	0.002

Note. Two-tailed *p-values* reported.

Next, to test the second hypothesis about the relation between valuation of long-term gains and socioeconomic status, we built a model testing the covariance between *delta* and INR, again including personality traits as covariates (Figure 2B). INR did not significantly correlate with decreased preference for waiting for larger reward values, b = -.006, β = -.048, p = .062.

Our exploratory tests of relationships with personality traits revealed that *delta* was negatively associated with Planfulness, b = -0.011, β = -.078, p = .032, controlling for levels of conscientiousness and impulsivity, indicating that an individual with a higher score on the Planfulness scale is very slightly more likely to discount less than a person with the same score on the Conscientiousness and BIS scales but a lower Planfulness score (see Table 4). We again observed that INR was significantly positively correlated with scores on the Planfulness scale, b = 7.27, β = .18, p < .001, and significantly negatively correlated with scores on the BIS, b = -1.58, β = -.10, p = .003.

Table 4
Exploratory linear regressions on delta parameter and INR

	b	SE	β	p
delta parameter				
Planfulness	0.01	0.01	0.08	0.03
Conscientiousness	0	0	-0.04	0.28
BIS	0	0	0.01	0.72
INR				
Planfulness	7.27	1.95	0.18	< 0.001
Conscientiousness	-0.72	0.42	-0.06	0.088
BIS	-1.56	0.52	-0.10	0.003

Note. Two-tailed *p-values* reported.

A final model testing the unique associations between personality constructs and SES contained only the latent personality trait variables and the observed INR variable (see Figure 2C). The patterns observed in the prior results were again apparent, with planfulness (b = 7.45, β = 1.12, p < .001) and impulsivity (b = -1.54, β = -.10, p = .002) found to significantly relate to INR in the hypothesized direction: greater planfulness and lower impulsivity related to higher SES. Conscientiousness was not related to INR (b = -0.72, β = -.06).

Table 5
Model 3 results

	b	*SE*	*β*	*p*
INR				
Planfulness	7.44	1.98	0.19	< 0.001
Conscientiousness	-0.72	0.42	-0.06	.96
BIS	-1.54	0.52	-0.10	0.002

Note: One-tailed *p-values* reported.

Discussion

The goal of this work was to test whether and how socioeconomic status relates to temporal discounting and relevant personality traits in a large, ecologically valid sample. We constructed *a priori* structural equation models to test a set of hypotheses about the relationships among these variables that were derived from both lay and scientific theories of the psychology of poverty. We found mixed support for these hypotheses.

First, we tested the hypothesis that SES is negatively associated with a preference for sooner (over later) rewards if the sooner reward is obtained *today* rather than in the future, operationalized with the *beta* parameter from the CTB task. When controlling for a person's baseline discounting rate (the *delta* parameter), our results did support this

hypothesis, though the standardized effect size is small (β = .06). We next tested the hypothesis that SES would be positively associated with reduced preference for sooner rewards, indexed with the *delta* parameter. We observed no statistically significant relationship between these variables, though we were well powered to detect such an association. Finally, we tested the hypothesis that SES would track positively with trait conscientiousness and planfulness, and negatively with impulsivity. This hypothesis was partially supported, with a positive relationship between SES and planfulness and a negative relationship between SES and impulsivity observed in all three structural equation models. No statistically significant relationship with conscientiousness was found based on our registered one-tailed hypothesis as the observed association was negative. Though the values of the coefficients might seem small – an increase of one standard deviation in planfulness corresponding to an expected one point increase in INR, and one standard deviation in impulsivity to .60 of a point in INR – it's important to note that the parity of income-to-needs is 1; thus, one standard deviation in either of these traits could be associated with the difference between living below or above the poverty line.

One interpretation of these results is consistent with scarcity theory. Poorer people were not observed to have increased preference for sooner rewards (though they were observed to be slightly more present-biased) than people higher in SES, but there was a positive link between planfulness and SES. This latter association could reflect the constraints of poverty on poor individuals. Scoring high in planfulness reflects participants' reporting that they set explicit plans to reach their goals and take time to reflect on how their present actions relate to their long-term plans. Engaging in these psychological processes may be privileges that are forgone when living in an environment of scarcity, even if a person is not otherwise inclined to discount future outcomes. If, as the theory proposes, scarcity restricts attention to present threats and drains

cognitive resources, the observation that those living in impoverished environments score lower in planfulness while showing equivalent preference for sooner rewards is consistent with this theory– it seems logical that having one's mind occupied by threats to one's survival reduces the time and energy available for setting reliable, effective plans. In the laboratory, however, where there is no apparent scarcity constraint, poorer people did not tend to show a preference for sooner rewards in general. The slight increase in preference for sooner rewards if the sooner reward is obtained *today* complicates the picture somewhat, though it is plausible that scarcity may have a psychological effect not on different degrees of delay, but more specifically on preferences for rewards that can be used immediately to solve problems versus rewards that accrue in the future.

This latter point relates to another possible interpretation of the results–that the temporal discounting task used taps into people's *aspirational* choices, rather than assessing the way people actually make decisions in real life. That is, being faced with theoretical rewards ranging across temporal and monetary values on a computer screen is undoubtedly different from considering taking out a high-interest loan to pay this month's rent. This may be why we did not observe a relationship between SES and patience for future values on the CTB task but did observe one between SES and scores on the BIS – ecological impulsivity is qualitatively different from impulsivity measured on laboratory tasks. Relying on a survey measure of financial decision-making is an admitted limitation of this study, but the decision to use such measure was made in order to increase our sample size. Nevertheless, this limitation also presents a ripe opportunity for future research to determine whether more direct measures of financial decision-making and/or temporal discounting exhibit different patterns across SES.

We have discussed the consistencies of our results with scarcity theory, but what of the implications for the lay "just world" theory? One

might be inclined to conclude that these results are also consistent with it – less planful, more impulsive people seem to be poorer. However, a less superficial engagement with the just world notion of deservingness makes prominent two of its primary assertions: first, that the observed personality traits cause, to some extent, income; and second, that such an outcome is justified, or desirable. This first claim is just one of many causal stories these data are consistent with, and scarcity effects are one example of an alternative. With regards to the second assertion, no empirical finding can possibly adjudicate whether, if such a causal story is true, it is a just and desirable state of affairs.

In the face of this final point we underscore the reminder that our results indicating relationships between SES and the personality traits of planfulness and impulsivity are non- directional and not causal. We did not set out to test lay or scientific theories about psychology and poverty, but instead wanted to determine whether relationships between the two existed at all. Given the careful design of our research to meet this aim, we conclude that relationships between SES and specific personality traits, as well as a component of temporal discounting, do indeed exist based on the present data. It is our hope that our results will be used to inform the development and refinement of theories about the effects of poverty, and to serve as an informative source for those wishing to inform public policy with empirical research.

Open Practices

This paper was submitted as a registered report, wherein all hypotheses and data analysis plans were established prior to observing the collected data and producing results. Materials, R code for analyses, and the study data are open and available at the project Open Science Framework page, https://osf.io/bjrw2/.

CHAPTER III

STUDY 2: MONTHLY SPENDING BEHAVIOR BY THE AMERICAN POOR AND MIDDLE-CLASS: PURCHASES, PLANNING, AND PERSONALITY

This chapter contains ongoing research co-authored by C. Dlouhy and E. T. Berkman. I have lead all aspects of this project to-date, including study design, data collection, data analysis, and writing the first draft of the manuscript. My co-authors have provided input at each stage of the project, and will contribute edits to all versions of the manuscript, including those in the final version accepted for publication.

> [T]here are literally two Americas. One America is beautiful for situation. And, in a sense, this America is overflowing with the milk of prosperity and the honey of opportunity. This America is the habitat of millions of people who have food and material necessities for their bodies; and culture and education for their minds; and freedom and human dignity for their spirits. In this America, millions of people experience every day the opportunity of having life, liberty, and the pursuit of happiness in all of their dimensions. And in this America millions of young people grow up in the sunlight of opportunity.
>
> But tragically and unfortunately, there is another America. This Other America has a daily ugliness about it that constantly transforms the ebulliency of hope into the fatigue of despair. In this America millions of work-starved men walk the streets daily in search for jobs that do not exist. In this America millions of people find themselves living in rat-infested, vermin-filled slums. In this America people are poor by the millions. They find themselves perishing on a lonely island of poverty in the midst of a vast ocean of material prosperity.
>
> — Dr. Martin Luther King (1967)

Introduction

For most American families, worrying about having enough money to afford the basics of food, shelter, and clothing is something rarely – if ever – experienced. For millions of others, this describes their daily life. Living in poverty means living in an environment where access to resources that fulfill basic needs is unreliable, and the resources themselves are scarce and often of poor quality. Those who live in low-income areas are likely to reside in noisy, crowded, deteriorating buildings (Lott, 2012), be exposed to greater amounts of pollutants (Brulle, & Pellow, 2006) and crime (Brooks-Gunn, Duncan, & Aber, 1997), and have restricted access to grocery stores (Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007), greenspaces, transportation, and childcare (see Evans, & Kantrowitz, 2002 for a review). As Dr. King observed, socioeconomic inequality has led to sharp qualitative differences in the lives lived by people in the two Americas.

How many of these distant compatriots will ever walk in one another's shoes? National trends in socioeconomic mobility assess how many households have upwardly- or downwardly-mobilized into a different socioeconomic strata. Recent generations of American families have experienced reduced likelihood of upward mobility and greater rates of downward mobility (Hout, 2019), and this is especially true for Black American families (Chetty, Hendren, Jones, & Porter, 2018). Of particular importance for social welfare policy is understanding the variables driving these trends — what predicts if someone moves from a white picket fence and well-manicured lawn, to a dirty, inner-city sidewalk? Existing theories afford different amounts of causal influence across the environmental-individual continuum of factors, while yet others instead primarily credit randomness (Pluchino, Biondo, & Rapisarda, 2018). The present work is a study of the daily experiences of poor- and middle-class Americans to test whether patterns in real-world financial decision-

making are dissociable according to socioeconomic environment, individual psychology, and/or their interaction.

Environmental Influences. There is evidence to suggest that impoverished environments negatively impact cognitive functioning. Specifically, the stressors that people living in poverty face due to chronic deprivation may tax cognitive resources used in decision-making and long-term planning. First, the poor have limited access to foods with adequate nutritional value. The lack of proper nutrition has been associated with diminished performance on tedious tasks measuring mental stamina (Schilbach et al., 2016). Under-nutrition in childhood is negatively correlated with cognitive achievement later in life (Cunha & Heckman, 2009; Liu, Raine, Venables, Dalais, & Mednick, 2003). Second, poor families are likely to live in crowded homes within noisy neighborhoods (Decarlo Santiago, Wadsworth, & Stump, 2011). This affects the duration and quality of their sleep. Not getting enough restorative rest directly impairs several executive functions (Bickel et al., 2014). Third, the poor face more daily hassles. This increases their overall stress relative to other classes (Diemer et al., 2013) and this stress is linked with impaired functioning in cognitive control areas of the brain (Duncan, Magnuson, & Votruba-Drzal, 2017).

All of the aforementioned factors can also result in frequent worrying. Indeed, people who are poor experience anxiety related to the experience of living in poverty (Santiago et al., 2011), and anxiety has been associated with diverted attention and impaired cognitive performance in a general population (Maloney, Sattizahn, & Beilock, 2014). In a non-clinical population, anxiety can be a beneficial emotional response to threat cues indicating that a need related to survival may go unmet, as it facilitates the focusing of attentional resources on resolving those hazards. Experiencing chronic deprivation may increase sensitivity to these cues, as living in an environment of scarcity means a constant buildup of pressing needs (Sheehy-Skeffington & Haushofer, 2014).

Together, these environmental factors may disproportionately deplete cognitive resources of the poor and lead to impaired executive functioning compared to that of wealthier groups. This 'scarcity mindset' has been further hypothesized to reduced ability to focus on long-term goals and make decisions consistent with them (Shah, Mullainathan, & Shafir, 2012), as for the impoverished what influences decision-making is more likely to be the concerns in the immediate moment and the resources available in the current environment. Previous research in psychology and economics has shown that lower socioeconomic status is associated with a decreased propensity for long-term planning of goals (Ludwig, Flournoy, & Berkman, 2019), and an increased preference for immediately available, smaller monetary incentives over future larger ones (Carvalho, Meier, & Wang, 2016). This latter pattern of temporal discounting is further associated with the real-world behavior of taking out a payday or title loan (Mahoney & Lawyer, 2016), which can impede socioeconomic mobility by using predatory interest rates to create paycheck-to-debt cycles (Sweet, Kuzawa, & McDade, 2018).

The accrued evidence therefore suggests that the likelihood of upward socioeconomic mobility may be limited by the situational aspects of poverty. If this is the case, a between-strata pattern should emerge where those with lower socioeconomic status exhibit greater preference for short-term economic rewards when they are immediately available, at the expense of long-term savings. This is one possibility explored in the current study.

Personality Influences. Personality traits are characteristics of individuals that are relatively stable across time and circumstances. The expression of two traits has been associated with different life outcomes for people within the same socioeconomic class: conscientiousness and neuroticism. Someone who is high in trait conscientiousness is described as orderly, efficient, self-disciplined, and

not impulsive, while being high in trait neuroticism is associated with being anxious, irritable, and impulsive (John & Srivastava, 1999).

Research shows that these traits can buffer or exaggerate the impacts of a person's socioeconomic environment. Chapman, Fiscella, Kawachi, and Duberstein (2009) conducted a longitudinal study to explain the overall greater rates of mortality among poor Americans. They found that scores on the Big Five personality traits explained roughly a fifth of the total variance in mortality rates ten years later regardless of socioeconomic status, as well as a main effect on mortality risk within social strata. Greater likelihood of mortality was positively predicted by neuroticism, and negatively predicted by conscientiousness. Another longitudinal study was conducted by Damian, Su, Shanahan, Trautwein, and Roberts (2015). Here, baseline measures of personality traits, intelligence, and family socioeconomic status were collected from high school students and used to predict their educational attainment, income, and occupational prestige eleven years later. Though the strongest predictor of adult socioeconomic status was childhood socioeconomic status, a similar pattern in the relationships of traits to positive and negative life outcomes as found by Chapman et al (2009) was observed. Conscientiousness was related to socioeconomic mobility, as the highly conscientious accrued more income and higher education levels than their peers, especially those high in neuroticism. These results suggest that individual-differences in people who share a social stratum are related to long term class mobility. This is another possibility that the current research explores.

Aim of the Present Study. The aim of the present work is to place real-world behavior of poor and middle-class Americans at the forefront of understanding socioeconomic inequality and mobility. To that end, this study leverages a longitudinal diary design to study how everyday financial decisions are related to socioeconomic context and individual psychology. Three hundred thirteen Americans drawn from all

50 United States were asked to record their daily spending behavior over the course of a month. This design permitted tests of multiple hypotheses connecting the variables of interest within an observation period of sufficient duration to capture a monthly pay period, the longest, most common pay cycle according to the U.S. Bureau of Labor Statistics (2020).

Socioeconomic Status and Personality Traits

This first group of hypotheses are derived from Ludwig, Flournoy, and Berkman (2019), in order to test whether the original findings replicate. The below predict specific directional relationships among socioeconomic status, temporal discounting, trait conscientiousness, and trait planfulness – a facet of conscientiousness specifically related to the pursuit of personal goals (Ludwig, Srivastava, & Berkman, 2018).

1. Replicating previous results, we expect to observe a negative relationship between socioeconomic status (SES) and present-bias in temporal discounting decisions, such that such that as SES increases, preference for smaller, immediately available monetary rewards over larger, future rewards will decline.
2. Replicating previous results, trait planfulness will be positively associated with SES.
3. Replicating previous results, trait conscientiousness will not be associated with SES.

Socioeconomic Status and Spending Behavior

This and the next group of hypotheses predict relationships among socioeconomic status, spending behavior, emotions experienced while making everyday purchases, and personality traits.

1. People with low SES will report higher rates of negative emotions while making non-discretionary expenditures, as compared to those with high SES.
2. People with low SES will experience an increase in the rate of experiencing negative emotions while making expenditures across

the days in the pay cycle, such that they will be higher at the end of the pay period, as compared to those with high SES.

3. Regardless of individuals' SES, the amount spent on discretionary items will be greatest after payday and decline over the rest of the pay period.

Personality Traits and Spending Behavior

1. The rate of experiencing negative emotions while making expenditures will be higher for those higher in trait neuroticism.
2. Discretionary spending will be higher for those with greater present-bias.

This research replicates and extends previous work by soliciting reports from people as they naturally go about their lives. Further, our sample of American citizens representative of those who report annual incomes either below the national poverty line or above the household median allows us to make comparisons between groups of people living in qualitatively distinct socioeconomic contexts based on a categorization set by the United States government.

Method

Participants and Procedure. Baseline survey data were collected online via Qualtrics panels. This is a service provided by Qualtrics, which maintains a participant database and compensates participants according to Qualtrics internal guidelines. All eligible participants were then invited by the researchers to continue their participation by completing a month long daily diary study. This study was administered directly by the researchers. None of the data had been viewed or altered in any way by any member of the research team prior to pre-registration of the analysis plan on the Open Science Framework; the pre-registration is available here: https://osf.io/bcs9d.

Baseline Survey

Sample size was determined by the budget. The maximum number of participants that could be recruited for the available funding were

recruited (N = 300). We planned the sample to include a subset of participants whose annual income placed them at or below the federal poverty line according to the most recent Census Bureau guidelines (e.g., $13,064/year for a single person household with no children as of 2018), and another subset that included individuals who self-reported annual incomes at or above the national median household income ($61,937 as of 2018). Three hundred participants were recruited according to the following income brackets: 40.03% of the sample reported an annual household income of $0-<$21K; 40.03% $60K-<$100K; and 19.94% $100K-<$150K. All recruited participants were consenting adults who were 18 years or older and native English speakers.

Qualtrics collected 10% of the total contracted sample (~30) as part of a 'soft launch', after which the researchers were permitted to view the data to check for issues with collection (e.g. invariable responses, items with consistent missing data). As there were no problems detected after the soft launch, Qualtrics continued data collection until the total contracted sample number was reached; termination was completed when Qualtrics determined that this amount of useable data had been collected. Responses were excluded from the final dataset provided by Qualtrics if they were only partially complete (i.e. survey abandoned before the end was reached), or if response times were equal to or less than one-half the median soft launch time. The total sample size of participants who had completed the baseline survey after this process was N=313, with Qualtrics including data from thirteen additional participants at no extra financial cost to the researchers.

This survey was completed only once at the beginning of the study. Participants were sent an online link to our survey by Qualtrics. The link directed them to our online consent form, and contingent upon their consent, to the online baseline survey. This survey presented measurements of socioeconomic class, personality, temporal discounting, personal finance, and demographics in a randomized order to the

particpants. Altogether, the measurements in the baseline survey took an average of 20 minutes to complete.

Expenditure Diaries

All participants who completed the baseline survey were invited to complete the diary portion of the study, which took place over the course of one month. Of the original 313 participants, 173 (55%) recorded at least one diary entry during the entire month of observation. Participants received additional compensation as part of their completion of this portion of the study, for a possible total maximum amount of $30.00 ($5/week/4 weeks, +$10 bonus payment for submitting all diary entries).

Every day during the observation period, participants completed a Qualtrics survey wherein they recorded their daily expenditures and answered questions about the nature of that expenditure (e.g. what general category best described what they spent money on, how stressed they felt when making the purchase; see Materials for full details). Diary entires took between 10-15 minutes to complete, dependent upon the number of purchases that a participant had made.

Materials. The baseline survey consisted of multiple measurements of personality traits and socioeconomic status, while the daily diary entries were restricted to questions about the recorded expenditures.

Measure of Socioeconomic Status

This study utilized an economic definition and measure of socioeconomic status. Participants answered two questions about their annual household income. One was free-response and prompted participants to enter in their approximate income. Concerned that this question might introduce noise due to imprecision, we additionally included an item asking participants to select from a drop-down menu of income brackets, as previously described in Chapter II of this dissertation.

We further included several individual items inquiring about personal finance. For the analyses conducted here, of relevance is an item which asked "when does the pay period of your work begin?," to which participants could either select the first or last day of the month, or could free enter another option. We used this item to create a new variable, time since payday; see Statistical Analysis section for details.

Measures of Personality

Participants were asked to complete The Planfulness Scale (Ludwig, Srivastava, & Berkman, 2018), a 30-item, three-factor measure assessing the propensity to plan to achieve long term goals. Items are responded to with a five-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*; example items include "when I want to achieve something, I set goals" and "I tend to take big projects and break them down into small pieces" (see Appendix A). They also completed The Big Five Inventory (John & Srivastava, 1999), a 44-item measure of the 'big five' personality traits – conscientiousness, neuroticism, extraversion, openness, and agreeableness – though we only calculated scores for trait conscientiousness and neuroticism in this study. Participants were asked to use the same five-point Likert scale as previously described to indicate the degree to which they saw themselves as a someone who e.g. "is a reliable worker" (conscientiousness), or who "worries a lot" (neuroticism). Trait planfulness was scored by averaging across all items in the Planfulness Scale, and trait conscientiousness and neuroticism were scored by averaging the relevant items from each subscale on the Big Five Inventory.

Measure of Temporal Discounting

To measure temporal discounting, we used the Convex Time Budget Task (CTB; Andreoni, Kuhn, & Sprenger, 2015). Participants respond to 24 items presenting different trade-offs between the size of a monetary reward and the time of payment. An example decision includes "$12.80 today and $4.00 in 5 weeks" or "$9.60 today and $8.00 in 5

weeks." Two parameters are extracted from this measure. δ (delta) represents a participant's patience (i.e., their tolerance for waiting for rewards), and β (beta) represents a participant's present bias (i.e., the additional amount they discount future rewards if the sooner reward is received today). As in Ludwig, Flournoy, and Berkman (2018), we have flipped the signs of these parameters for ease of interpretation, such that increasing values of delta represent increased discounting of future rewards, and increasing values of beta increased preference for rewards in the present. We extract these parameters using the following regression model as in Andreoni, Kuhn, and Sprenger (2015), which results in values between -1 and 1 for each parameter:

$$x_{\mathrm{t}} = \frac{20(\beta^{t_0}\delta^{k}P)^{\frac{1}{\alpha-1}}}{1+P(\beta^{t_0}\delta^{k}P)^{\frac{1}{\alpha-1}}}$$

Diary Measures

Diary measures were intentionally kept brief so as not to be too taxing for the participants to complete daily. Participants first were asked to record the cost of each purchase that they made that day. They were given the specific instructions that "…each time you made a payment should be considered its own purchase event. You may have, for example, gone to a store and bought several items, but here you would report the total value of the purchases, not of each individual item." Each purchase cost was a free-response item and recorded in U.S. dollars.

Next, participants were asked to describe the type of their purchases to the best of their ability. A drop-down list of categories commonly used by financial institutions was provided for them to select from, and included such categories as 'groceries' and 'rent'. Categories were additionally coded by the research team in terms of whether they were essentials (e.g. clothing, housing, food) or discretionary items See Appendix B for the full list of categories.

Finally, participants recorded the mood that they had experienced while making each purchase. They saw the statement, "When making this purchase, I felt [emotion]," where the emotions were: stressed, frustrated, sad, upset; happy, relieved. They additionally saw the statement, "When making this purchase, I didn't feel very much at all." They then indicated their agreement with these statements using a five-point Likert scale, 1 = *strongly disagree* to 5 = *strongly agree*.

Statistical Analysis. We employ a number of analysis techniques to test each group of hypotheses. Additionally, we constructed several new variables to represent our constructs of interest. This analysis plan was preregistered on the Open Science Framework, and can be viewed at https://osf.io/bcs9d.

Socioeconomic Status and Personality Traits

This group of hypotheses attempts to replicate the findings reported in Ludwig, Flournoy, and Berkman (2019), and therefore used the model specifications therein to test the relationship between SES and personality in the baseline survey data (see Figure 2, pg. 24 for the depiction of these models). We similarly use the calculation of income-to-needs ratio (INR) as the primary indicator of socioeconomic status, which is annual household income divided by the national poverty threshold where an INR equal to or less than 1 is indicative of poverty (Brito & Noble, 2014). The following are our pre-registered plans to test the hypotheses specified earlier.

1. The hypothesis regarding the relationship of SES to the relative value of immediate gains will be tested with the significance test on the covariance between beta and INR. Delta, planfulness, and conscientiousness scores will be included in the model as covariates.
2. The hypotheses about the relation of SES to personality traits will be tested by regressing INR on planfulness and conscientiousness in a single regression model.

These analyses were conducted on the full sample of participants who completed the baseline survey. Participants were excluded from analysis if they were missing at least one response from each decision pair on the temporal discounting task, were missing 50% or greater of a scale's set of items, or had an invariant set of answers on a measure (e.g., all '3' responses).

Socioeconomic Status and Spending Behavior

To test these hypotheses, two new variables were constructed from items included in the expenditure diaries and baseline survey data. First, a negative emotionality score was calculated per purchase. This was done by averaging responses to the stressed, frustrated, sad, and upset mood items from the accompanying diary entry, resulting in a total a range of 1-5, where larger scores indicate greater experienced negative emotions while making a purchase. Second, time since payday (TSP) represents the number of days since participants' reported start of their pay period, ranging from 1 (day paycheck was received) to 30 (tomorrow paycheck is due). We additionally were able to calculate the amount of money spent on each type of purchase (essential versus discretionary) per diary entry. Finally, in these models INR was treated as a binary categorical variable (as opposed to continuous as in the previous models), such that those who reported incomes at or below the poverty threshold consisted of one group, and those who reported incomes above the poverty threshold were in the other. In our sample, this corresponds roughly to a group of individuals with annual incomes of ~$0-21,000 and $60,000-$150,000, respectively.

Three multilevel models were run to test this group of hypotheses using the lme package in R (Bates, Machler, Bolker, & Walker, 2015). In all models, subject is included as a grouping factor to account for the repeated-measures design of the diary portion of the study. An example model is below. In this model, person *j*'s negative emotionality score recorded in diary entry *i* was regressed on purchase type of entry *i*,

controlling for person *j*'s INR. Both a random intercept and random slope of purchase type were included in the model:

First level model:

$\text{Negative emotionality}_{ij} = b_{0j} + b_{1j} * \text{purchase\_type}_{ij} + e_{ij}$

Second level model:

$b_{0j} = g_{00} + g_{01} * \text{INR}_j + u_{0j}$

$b_{1j} = g_{10} + u_{1j}$

1. The hypothesis predicting negative emotionality from type of purchase accounting for SES will be tested with the significance test of the coefficients representing purchase type (Level-1) and INR (Level-2) in the model.
2. The hypothesis predicting discretionary spending from day in the pay cycle will be tested with the significance test of the TSP (Level-1) coefficient in the model.
3. The hypothesis predicting negative emotionality from day in the pay cycle will be tested with the significance test of the coefficients representing TSP (Level-1) and INR (Level-2) in the model.

Personality Traits and Spending Behavior

We conducted two additional multilevel models to test each of the hypotheses in this group. As with the three previous models, subject was included in the model as a nesting factor.

1. The hypothesis testing the association between negative emotionality and trait neuroticism will be tested with the significance test of the coefficient for neuroticism score (Level-2) in the model.
2. The hypothesis testing the association between discretionary spending and present-bias will be tested with the significance test of the coefficient of beta (Level-2) in the model.

Results

Descriptives and Correlations. The following tables provide summaries of the variables of interest collected in this study. Table 6

presents the descriptive statistics for the measures collected in the baseline survey and expenditure diaries. Table 7 further breaks these descriptives out by INR category. Six participants were removed from analysis for response invariance on the personality scales. Of the 173 participants who consented to participate in the diary portion of the study, 34 (20%) completed all thirty diary entries, though all completed at least one entry. Figure 3 is a histogram of the number of diaries completed by participants.

Overall, participants scored near the midpoint of the scale on trait neuroticism (M = 2.84), and slightly above the midpoint on trait planfulness and conscientiousness (M = 3.95; M = 3.94). Additionally, participants expressed low rates of both discounting of future monetary rewards (M delta = -0.66) and bias towards rewards available immediately (M beta = -0.93).

Table 6
Descriptive statistics of measured variables

	n	Mean	Standard deviation	Observed range
Age	307	25.04	15.51	18 – 63
Planfulness	307	3.95	0.55	1.40 – 5.00
Neuroticism	307	2.84	0.95	1.00 – 5.00
Conscientiousness	307	3.94	0.71	1.56 – 5.00
INR	303	3.05	2.26	0.14 – 11.10
beta	312	-0.93	0.16	-0.66 – -1.27
delta	312	-0.98	0.03	-0.93 – -1.04
Neg. emotions	161	1.91	0.69	1 – 5
Daily expenditures	171	$39.56	$0.47	$0 – $1000.48
No. complete diaries	171	17.94	10.89	1 – 30

Note. INR = income-to-needs ratio. The signs of beta and delta have been reversed to aid with interpretability of results.

Table 7

Descriptive statistics of variables by INR group

	n	Mean	Standard deviation	Observed range
INR ≤ poverty line				
Age	101	20.94	14.05	18 – 62
Planfulness	102	3.79	0.62	1.40 – 5
Conscientiousness	102	3.77	0.72	1.56 – 5
Neuroticism	102	3.26	0.98	1 – 5
beta	100	-0.90	-0.15	-1 – -0.67
delta	100	-0.98	-0.03	-1 – -0.93
Neg. emotions	51	2.06	0.74	1 – 5
Daily expenditures	56	23.97	90.00	0 – 680.50
No. complete diaries	65	14.53	10.97	1 – 30
INR > poverty line				
Age	199	26.92	15.68	18 – 63
Planfulness	200	4.03	0.50	2.27 – 5
Conscientiousness	200	4.04	0.69	2.11 – 5
Neuroticism	200	2.63	0.87	1 – 5
beta	199	-0.94	-0.17	-1 – -0.66
delta	199	-0.99	-0.03	-1 – -0.93
Neg. emotions	101	1.81	0.64	1 – 3.83
Daily expenditures	105	$41.32	$78.23	$0 – $612.94
No. complete diaries	106	20.75	9.82	1 – 30

Note. The signs of beta and delta have been reversed to aid with interpretability of results.

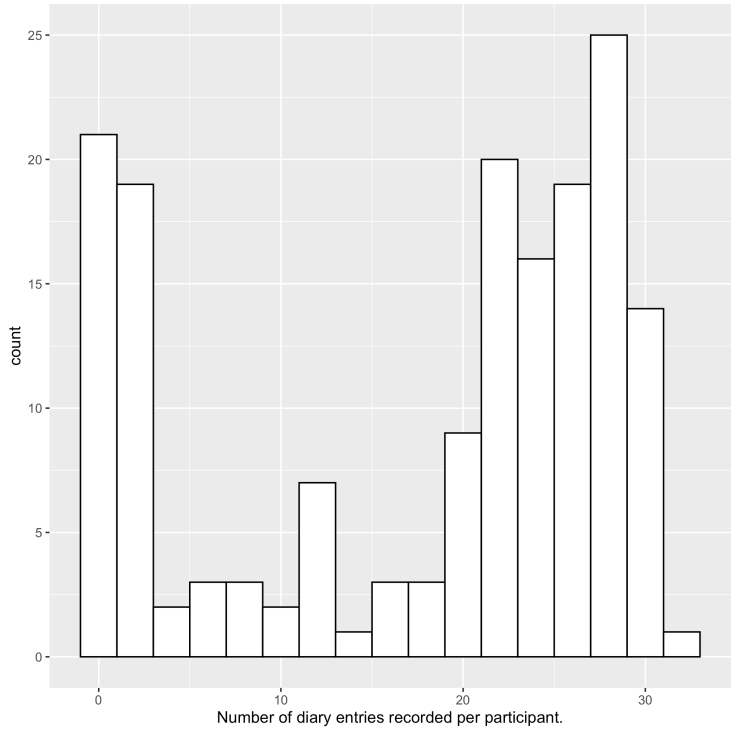

Figure 3. Histogram of the number of diary entries completed by 171 participants over the course of one month (thirty days). The average number of diary entries completed per-person was 17.94.

Table 8 is a correlation matrix of the variables collected in the baseline survey. The direction, size, and statistical significance of these associations replicated the findings in Ludwig, Flournoy, and Berkman (2019). Specifically, we observed a small positive correlation between planfulness and INR (r = .13), and INR and parameter delta (r = .15); a strong positive correlation between planfulness and conscientiousness (r = .56); and a strong positive association of parameters beta and delta (r = .72). Additionally, we found trait neuroticism to strong negatively correlate with planfulness (r = -.41), conscientiousness (r = -.60), and INR (r = -.27).

Table 8
Correlation matrix of survey variables.

		1 Plan.	2 Neur.	3 Consci.	4 INR	5 beta	6 delta
1	Planfulness		307	307	304	304	303
2	Neuroticism	**-.41**		307	303	304	303
3	Conscientiousness	**.56**	**-.60**		303	304	303
4	INR	**.13**	**-.27**	.15		307	299
5	beta	.02	.06	.03	.10		307
6	delta	.06	.03	.07	**.15**	**.72**	

Note: **Bolded** values are significant at $p < .05$. The signs of beta and delta have been flipped to aid with interpretability of results. Sample size is along the upper diagonal.

An additional correlation was run to describe the relationships among survey and expenditure diary variables of interest. Table 9 contains these correlations.

Table 9
Correlation matrix of survey and expenditure diary variables.

		1 P.	2 N.	3 C.	4 INR	5 b	6 d	7 NE.
1	Planfulness		164	164	164	164	164	152
2	Neuroticism	**-0.41**		164	164	164	164	152
3	Conscientiousness	**0.51**	**-0.62**		164	164	164	152
4	INR	**0.19**	-0.24	0.19		164	164	152
5	beta	-0.04	0.16	0.06	-0.10		165	153
6	delta	0.01	0.16	0.00	-0.07	**-0.65**		153
7	Neg. emotions	**-0.26**	**0.39**	**0.36**	-0.20	0.10	0.13	
8	Daily expenditures	0.16	0.00	0.09	0.09	0.01	-0.01	0.10

Note: **Bolded** values are significant at $p < .05$. The signs of beta and delta have been flipped to aid with interpretability of results. Sample size is along the upper diagonal.

Hypothesis Testing. We tested our hypotheses using multiple statistical modeling techniques.

Socioeconomic Status and Personality Traits

One structural equation model was run to test whether the previously observed association between socioeconomic status and present bias reported in Ludwig, Flournoy, and Berkman (2019) was replicated here. Results revealed that the covariance between INR and parameter beta (controlling for delta, planfulness, and conscientiousness) was not statistically significant, $b = 0.00$, $\beta = 0.02$, $p = 0.84$. SES was not found to relate to the tendency to selectively choose rewards made immediately available. Table 10 contains the full results from this model.

The next structural equation model was run to test the replication of the association between socioeconomic status and personality traits. Consistent with previous results, conscientiousness was not observed to relate to socioeconomic status, $b = 0.57$, $\beta = 0.12$, $p = 0.60$. Contrary to previous results, and to our hypothesis, planfulness also was not related, $b = 0.54$, $\beta = 0.09$, $p = 0.14$. SES was not found to relate to participants' levels of conscientiousness or planfulness.

Table 10
Linear regressions on beta parameter and INR

	b	*SE*	*β*	*p*
beta parameter				
delta parameter	4.11	0.22	0.73	< 0.001
Planfulness	0.00	0.02	0.00	0.91
Conscientiousness	0.01	0.02	0.04	0.38
INR				
delta parameter	-12.25	-4.41	-0.16	0.01
Planfulness	0.61	0.36	0.10	0.09
Conscientiousness	0.54	0.31	0.11	0.08

Note. Two-tailed *p-values* reported.

Socioeconomic Status and Spending Behavior

A multilevel model was run to test whether negative emotions were reported more frequently for Americans who live at or below the poverty line, as compared to those living above, while making essential (i.e., non-discretionary) purchases. Figure 4 is a plot of these variables. The intercept term, g_{00}, representing the mean negative emotionality rating for people living in poverty when they made non-discretionary purchases, was 2.15 (95% CI [1.97, 2.33], $t(1777) = 23.61$, $p < .001$). The effect of purchase type was found to be statistically significant and negative, $b = -0.22$, 95% CI [-0.30, -0.14], $t(1777) = -5.24$, $p < .001$; $\beta = -0.13$, 95% CI [-0.18, -0.08]), meaning people indicated more negative emotionality for non-discretionary versus discretionary purchases. The effect of SES was also significant and negative, $b = -0.27$, 95% CI [-0.47, -0.06], $t(1777) = -2.54$, $p < .05$; $\beta = -0.14$, 95% CI [-0.25, -0.03]), meaning that poorer Americans reported higher rates of negative emotionality when making non-discretionary purchases, as we hypothesized.

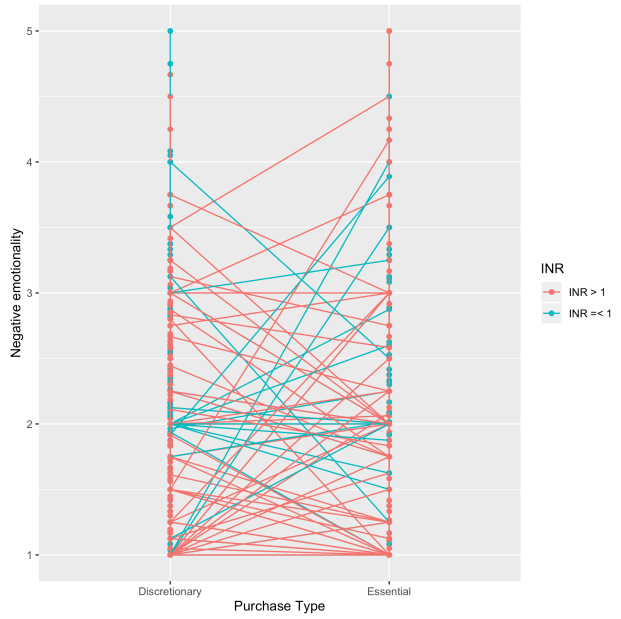

Figure 4. Plot of negative emotionality ratings by purchase type. Lines connect observations by participant. Blue lines represent participants living at or below the poverty line; red those living above.

The next multilevel model tested whether discretionary spending differed according to time since payday. The intercept, or the average amount spent on discretionary purchases at the beginning of the pay cycle, was $25.47 (95% CI [9.65, 41.30], $t(1405) = 3.16$, $p < .01$). The linear effect of day in the pay cycle was not significant, $b = -0.17$, 95% CI [-0.90, 0.57], $t(1405) = -0.45$, $p = 0.65$; $\beta = -0.01$, 95% CI [-0.06, 0.04]). There was no evidence of downward linear trend in discretionary spending along the pay period, contrary to our hypothesis.

The final model run for this group tested whether negative emotionality was reported at higher rates for participants living at or below the poverty line, as compared to those living above, at the end of the pay period. The intercept of negative emotionality, on the first day of the pay period for those living at/below the poverty line, was 2.12 (95% CI [1.77, 2.48], $t(864) = 11.62$, $p < .001$). Neither day in the pay period (b = -2.91e-03, 95% CI [-8.25e-03, 2.43e-03], $t(864) = -1.07$, $p = 0.29$; β = -0.03, 95% CI [-0.08, 0.02]) nor SES ($b = -0.31$, 95% CI [-0.69, 0.07], $t(864) = -1.62$, $p = 0.11$; $\beta = -0.13$, 95% CI [-0.28, 0.03]) were statistically related to negative emotionality in this model, contrary to our hypothesis.

Personality Traits and Spending Behavior

The first multilevel model in this group of hypotheses tested whether those higher in trait neuroticism associated spending with greater rates of negative emotionality; trait neuroticism was centered in this model. The intercept of negative emotionality, meaning the predicted negative emotionality score at the mean neuroticism score, was on the low end at 1.85 (95% CI [1.76, 1.94], $t(1780) = 7.31$, $p < .001$). Neuroticism was found to positively predict negative emotionality associated with daily spending, $b = 0.29$, 95% CI [0.20, 0.39], $t(1780) = 41.17$, $p < .001$; $\beta = 0.30$, 95% CI [0.20, 0.40], consistent with our hypothesis.

Our final multilevel model provided a test of the relationship between discretionary spending and present bias. The intercept of discretionary spending when parameter beta = 0 (so, no bias expressed toward present or future rewards) was at -38.36 (95% CI [-432.49, 355.77], $t(3089) = -0.19$, $p = 0.849$). The effect of present bias was not statistically significant, $b = 94.22$, 95% CI [-316.71, 505.15], $t(3089) = 0.45$, $p = 0.65$; $\beta = 0.08$, 95% CI [-0.28, 0.45]). There was no observed relationship between present bias, indexed by the beta parameter extracted from the CTB task in the baseline survey, and amount recorded spent on discretionary purposes in the expenditure diaries.

Discussion

We set out to test several groups of hypotheses about the relationships among personality traits, socioeconomic context, and spending behavior, with the broader goal of understanding how the former two factors may contribute to socioeconomic mobility. Overall, support for our hypotheses were mixed. We found that spending on non-discretionary purchases was associated with negative emotions at a greater rate for poor- versus middle-class Americans, and that those who scored higher in neuroticism also were more likely to experience negative emotions while making purchases, regardless of the purchase type, or of individuals' socioeconomic status. The rest of our hypotheses were not supported, including those based on the earlier findings reported in Ludwig, Flournoy, and Berkman (2019).

We chose to include trait neuroticism in this study due to previous work showing its potential for accentuating the negative impacts that impoverished environments have on the people who live in them. Here, we reveal an additional relevant finding – that those who are highly neurotic have negative affective responses to spending money, regardless of whether it is on 'fun' types of purchases, like going out to eat or seeing a movie, or on typically unenjoyable expenditures, such as bills. A

natural subsequent question to ask if this trait may therefore be *adaptive* for socioeconomic mobility, by reducing the hedonic motivation behind making purchases and therefore promoting saving versus spending behavior. While we did not include a direct test of whether trait neuroticism predicted total amount spent during the observation period, the correlation between the two (see Table 9) was small and statistically non-significant. Based on the evidence here, we cannot conclude that trait neuroticism contributes to upward socioeconomic mobility, though this is a possibility that future studies may want to explore.

However, our findings may support the opposite trend, as suggested by previous literature, that neuroticism can compound economic struggles. We observed that negative emotions were high when people spent money on non-discretionary items, such as rent and groceries, and this was especially true for those who struggle to afford these essentials. These results are consistent with psychological theories that propose that living in poverty is associated with a uniquely high levels of stress. The additional association with purchase type in our data may have implications for likelihood of negative socioeconomic mobility, as the particular aversiveness of, for example, paying utility bills, may result in those expenditures being delayed (and growing due to late fees) or forgone altogether. This is another possibility that we did not directly test here but is worth additional future study.

Interestingly, though the correlations among baseline survey items replicated those reported in Ludwig, Flournoy, and Berkman (2019), the results of the structural equation models did not. One potential explanation is the difference in sample size; as noted in the original paper, a sample size of $N = 1{,}073$ was required to detect a small ($r = 0.1$) effect with 90% power, while our sample size here even in the baseline sample was less than a third of this figure. Of course, it is also possible that the effects observed, either here or previously, were due to noise or random chance. Additional attempts at replicating the additional findings

are warranted, and future evidence is still necessary to assess true the relationship among these variables.

We also used the beta parameter extracted from the CTB task to test whether discretionary spending reported in the expenditure diaries was related to present bias and did not find a statistically significant relationship. Although unanticipated, it may be the case that the timing and nature of the task, which occurred immediately prior to the diary portion of the study and was completed online and in hypothetical terms, may have been a contributing factor. Previous studies have shown that lab-based measures of temporal discounting do predict real world behavior (Hamilton & Potenza, 2012; Mahoney & Lawyer, 2016), but nevertheless, our study design does permit further investigation of the relationship between temporal discounting as measured on a survey and real-world financial decision-making. Specifically, a follow-up study using these data will instead decompose parameters of temporal discounting from the expenditure diaries themselves to determine if there are patterns in spending smoothness and consistency that are dissociable by SES and personality.

A major limitation of this study was participant attrition during the period of observation. As was depicted in Figure 3, there was a bimodal distribution of the number of diary entries completed, such that fewer than half of participants enrolled in the diary portion of the study submitted between 25-30 (all) entries. This impacted the estimates and reliability of the findings that we report here, so we encourage future attempts to replicate and expand on our results.

An additional limitation is that half of the diary portion of the study occurred before the United States began issuing national lockdowns to address the growing COVID-19 pandemic in early 2020, and half of it fell after much of the country was shut down. This pandemic undoubtedly affected some of the variables we studied here, including spending behavior and negative emotionality. It is also

extremely likely that those living in already precarious life circumstances were disproportionately affected by this crisis. The pandemic may also be related to why we did not find any association of day in the pay cycle with any of our other variables; the timing of lockdowns may have driven some people to spend more towards the end of the cycle where they normally would have saved until the next paycheck, or others to spend less at the end due to spending more in the middle on pandemic supplies. Attrition rates may also have increased more would have otherwise been usual for such a study design due to the chaotic nature of this time period. Thus, the exceptional impact of the COVID-19 pandemic on the world means that we cannot rule out the potential effects that it may have had on our data and, more importantly, on the participants who provided responses to us.

Finally, one important limitation of our work is a lack of studying these relationships within the context of race and gender. Rates of poverty have been consistently higher for Black Americans and Hispanic Americans for decades (Creamer, 2020), and income inequality between women and men has persisted despite recent gains in median take-home pay for women (Semega, 2019). While the intention of the present study was to investigate main effects of socioeconomic context and personality traits, the reliance on annual income as our main indicator of SES limited our study of the sociological aspects of inequality. Future studies could improve upon the present research by using operationalizations of SES that are sensitive to these factors.

In conclusion, our study offered an ecological look at the spending behavior of poor- and middle-class Americans as they made important financial decisions in their everyday lives. We found evidence that spending money is an affectively negative experience for people who are high in neuroticism, and especially for people living below the poverty line making non-discretionary purchases. Our study faced practical limitations and was likely affected by the global coronavirus pandemic of

2020, necessitating future research to further explore the relationships among the variables we studied here. Regardless, this study provides more evidence that people who live in poverty face unique struggles that color their everyday emotions and behaviors. By better understanding these struggles, we can develop solutions to alleviating them, leading to a better quality of life for millions of people.

CHAPTER IV
GENERAL DISCUSSION

Introduction

The first written description of the national ethos known as the "American dream" appeared in a 1931 novel by James Truslow Adams. In *The American Epic*, Adams described American citizens as sharing "that dream of a land in which life should be better and richer and fuller for everyone, with opportunity for each according to ability or achievement." This message of equity and mobility stood as a beacon of hope for American citizens and people around the world who were eager at the chance to improve their lives and turn the dream into their reality. However, evidence suggests that the modern day United States falls far short of these lofty ideals. The vast majority of the total income in the country is earned only by a small percentage of the total population (U.S. Census Bureau, 2018), placing the United States in the top five most unequal Organization for Economic Co-operation and Development (OECD) countries since 2013 (OECD, 2018). Additionally, analysis of U.S. zip codes reveals that differences in the concentration of resources, quality of life, and mortality rates along distinct community lines are

pervasive throughout the country (Gould & Marlin, 2019). How did a wealthy country with culturally-held values of equal opportunity and potential prosperity for all come to exhibit such an extreme level of inequality? And what can be done to change it?

The goal of this dissertation is to further scientific understanding of this level of socioeconomic inequality observed in the modern United States, to reveal ways to improve the efficacy of social welfare policy. The previous two chapters presented empirical evidence illuminating how the nature of socioeconomic inequality may make it difficult for people to mobilize out of lower socioeconomic classes and that the interaction of psychological factors may add to that difficulty. Specifically, socioeconomic status is inversely related to pursuit of long-term goals, both in terms of general mental orientation and the practical use of strategies to achieve them. Further, being highly neurotic is associated with increased endorsement of feeling negative emotions during economic activity, which may in turn predict avoidant behaviors. In this final chapter, I add to a comprehensive understanding of socioeconomic inequality as a multifaceted phenomenon, in-line with several recent calls to expand beyond conceptualizations that are primarily economic (Adamkovič, Martončik, Lačný, & Kačmárová, 2020; Krieger, Williams, & Moss, 1997; Ravallion, 2011). Here, I review extant literature connecting the topics of inequality, psychology, and policy. The purpose of this review is to highlight several ways that psychological approaches such as the one adopted in this dissertation can contribute to a scholarly understanding of the effects of public policy]. I conclude with recommendations for future work in the areas of scientific research and public policy.

Psychology and Policy

Research in psychology provides added value to understanding: the phenomena of socioeconomic inequality. It can, for example, illuminate behavioral trends across socioeconomic strata, or identify

potential factors to target for intervention programs. There are many opportunities for future researchers to study how these factors can improve the prognosis for people living under the poverty line. As scientists who study people, psychologists are uniquely positioned to examine the individual-level effects that poverty has and make valuable efforts towards improving lives. The following sections tie together brief summaries of psychological theories and policy outcomes, to demonstrate how the former can potentially inform and improve the latter.

Social Perception and Policy Enrollment. Consider that in human societies, predictions about a person's entire life can be made the second that they are born. Are they likely to go to college, get a white-collar career, and live a long, healthy life? Or are they more likely to drop out of high school, work minimum-wage jobs, and suffer from physical and mental health issues? The answers to these questions depend on the characteristics of the individual, but also on the society's normative expectations of the ways people behave and the roles they take. Together, they can place people in a socially-constructed category right from the start that will influence the trajectory of their lives. This is evident both in how people within society see each other (e.g., stereotypes), but also in how people see themselves within that society (e.g., socioeconomic class identity).

Establishing rules and expectations for social behavior is important to maintaining a social order. The U.S. government has traditionally relied primarily on economic rules to determine whether or not people are considered in need enough to be eligible for welfare assistance. This process of "means testing" determines whether or not a household, defined as the number of people living under one roof, has the financial resources available to afford basic necessities. Importantly, and often overlooked, is that the minds of people in a given society that are tasked with upholding the social order also rely on rules and

generate social categories to make sense of others and themselves. These inner worlds will interact with external policy and each will influence the other. But psychological theory is uniquely suited to understand the role that social perception may have on policy-relevant outcome behavior.

Self-categorization theory provides such one mechanistic explanation (Turner & Oakes, 1986). According to this theory, categorization of people being perceived into different social groups proceeds from three steps. First, accentuation of the differences for between-group features occurs when similarities are salient enough to form within-group categorization; that is, similarities among the majority of people in a group highlight the dissimilarities of them with others. Next, depersonalization occurs to the extent that a person redefines their personal self according to a group identity, or the extent that a person redefines another's identity similarly to a social group category. Finally, the categorization process results from the *a priori* experiences and expectations a person has about specific social groups, as well as their interpretation of how well they themselves or another fit a social group category (with the latter being informed by social norms). This theory suggests that at a mechanistic level, categorization is personalized, and will depend upon people's subjective experience of the world; and evidence from real world policy deployment support this hypothesis.

Several examples from the real world demonstrate that how social categories are defined and perceived can impact whether policy is successful at reaching the population that it intends to help. As discussed in Chapter II, negative cultural stereotypes about the poor are common in America. Research suggests that these stereotypes have led to stigmatization of welfare programs, such that those who use these programs may be categorized derogatively, and such that those who are eligible for these programs may not enroll due to a perceived misalignment of who the programs are for.

Former enrollees in the Temporary Assistance for Needy Families program (TANF) who applied for unemployment were more likely to be recommended for low-wage labor positions than administrative positions for which they were qualified (Jacob 2005). Qualitative and quantitative analysis of the experiences of low-income African American single mothers revealed that often their attempts to gain employment were prevented due to the assumption that they are lazy or would not be good workers (Jarrett 1996). Perhaps part of the judgment that people who are living in poverty are lazy comes from the observation of unemployed poor people, without the contextual understanding of how the poor are denied jobs based on that same perception.

Enrollment in welfare programs may be seen by many as a normative behavior for freeloaders, and therefore people who do not identify as such may reject help in this manner even if they otherwise need it. Moffitt (1983) describes the puzzling finding that in 1970, 30% of families eligible for the Aid to Families with Dependent Children program did not enroll. He writes, "…this seemingly irrational rejection of an increase in income is…resulting from welfare stigma– that is, from disutility arising from participation in a welfare program per se." In other words, the very thought of being a welfare recipient was enough to change the subjective value of the economic benefit given by the program. Gennetian and Shafir (2015) cite a similar finding about the enrollment into the Supplemental Nutrition Assistance Program (SNAP). In 2007, only 40% of those eligible for SNAP benefits actually enrolled in the program. One proposed solution was to change the appearance of the SNAP vouchers themselves. They were made of paper (i.e., "food stamps") and were therefore a visible signifier of the recipient's social class presented in a public location (the grocery store). Using the food stamps may have elicited feelings of identity-based shame, and perhaps discriminatory treatment, thereby becoming something to avoid. In the late 1990s SNAP benefits were transferred to plastic cards that looked

similar to credit cards– signifiers of the middle- and upper-classes. Enrollment in SNAP increased after this change was made.

Anti-poverty programs or opportunities for social mobility may also be rejected by those who are poor because those who are not are thought of as the outgroup; that is, those who strongly identify with their social class will not see attempts to mobilize out of that class as a normative behavior. Blank (2005) describes this effect with reference to qualitative work on poor communities. She writes, "Having a sense of social "place" can provide self-identity, but it can also limit opportunities. Ethnographic research provides ample evidence of situations where children from a particular group (black children, female children, children of Appalachian miners) are taught by their parents as well as their schoolteachers that only certain life choices and job options are open to them." People from tightly-knit poor communities may be ostracized for taking opportunities to improve their social status, because this non-normative behavior may be seen by the community as a rejection of their group identity. Higginbotham and Weber (1992) surveyed white and black middle- and working-class women and found that overall, working-class parents were less supportive of their children enrolling in higher education, and over 40% of working-class respondents did not indicate that their families encouraged them to consider a career. Those living in areas where behaviors such as going to college are not normative may lack role-models for these types of behavior, making it less likely that they will consider doing so themselves. Chetty and Hendren (2015) found in a quasi-experimental study that children who moved into higher-SES neighborhoods had improved mobility outcomes proportional to the time spent living there.

Blank (2005) summarizes why welfare policy development should be sensitive to the social norms of a community, saying, "[u]nvoiced assumptions about appropriate roles and expectations on the part of the nonpoor as well as the poor may sabotage efforts at job training, job

placement, or educational improvement." Social perception is subjective, but nevertheless influential for how policy reaches its target population.

Social Groups and Policy Implementation. Psychological research suggests that individual beliefs also influence the mechanisms through which resources to implement policy are distributed. For example, social dominance theory would predict that this would be expressed to further entrench society's present status hierarchy (Sidanius, Pratto, Martin, & Stallworth 1991). Under this theory, people associated with the dominant group would be funneled into preferable roles in society, specifically those that would accrue more social resources because such beliefs justify and maintain the current social order. Biased distribution toward socially dominant groups is also a prediction of human capital theory, which suggests that those of higher social status invest more time and behavior effort into developing skills and education in their offspring (Becker, Kominers, Murphy, & Spenkuch, 2018).

Any bias in distribution will pose a problem for implementing policy, as the goal of welfare policy is often to reduce existing bias. For example, cash transfers are a popular program with governments looking to boost their citizens above the poverty line, but there have been noted struggles with their implementation that have been linked to resource distribution. Cash distributions in some countries have been shown to be used as an election tactic by a sitting government, trading life-saving aid for votes (Farrington & Slater, 2006). Additionally, policies restricted to cash infusions might fail because socioeconomic inequality has resulted in drastically disparate qualities of life for those who are poor, as discussed in Chapter III. A scarcity mindset may lead recipients to make present-biased decisions with their new funds, while an environment of crumbling infrastructure and predatory institutions can create poverty traps that are difficult to escape from (Ghatak, 2015). Policies that foster comprehensive networks of support, rather than just focusing on one-

time economic boosts, have been found to be more effective for reducing poverty rates and are less expensive for the administering government (Peters et al., 2016). How resources are distributed through social groups is therefore a factor that influences how policy is implemented, and how effective it is for the target population and broader society.

Personal Beliefs and Policy Support. The mapping between socioeconomic inequality beliefs and either its endorsement or opposition may be a function of the prestige that individuals hold each other with. It may also be a function of psychological processes evoking emotional responses to things that are seen as equitable – whether observed social stratification is morally fair or just. Relative deprivation theory (Runciman, 1966) proposes that the intergroup comparisons that individuals make can influence them to take behaviors that either reinforce or resist the existing status quo. The belief that one's identity group is deprived whereas outgroups are privileged can motivate people to improve the position of their identity group in society and encourage participation in collective action to do so. At the same time, the belief that one's identity group justly occupies a position of high status in society will also encourage behaviors that maintain the existing stratification structure and prevent outgroup members from upwardly mobilizing. Perception of equity, therefore, is an important factor in determining the actions people take in maintaining or disrupting the existing social order.

For instance, public approval of welfare policy has been shown to relate to individual perception of inequity. The degree to which one is dissatisfied with inequality correlates positively with support for government interventions to reduce it (e.g., via welfare programs, Bullock, Williams, & Limbert, 2003; income redistribution, McCall & Kenworthy, 2009; establishing minimum living standards and jobs, Shelton & Wilson, 2009). Social contact theory proposes that intergroup prejudice can be reduced through cross-group exposure within favorable

circumstances, generally through the processes of increased individuation of and identification with outgroup members (Miller, 2002). With regards to individual perception of inequality, increased social contract with members of disadvantaged groups may reduce attributing socioeconomic class to personal characteristics, and general support for a hierarchical society (Shariff, Wiwad, & Aknin, 2016).

Judgments of equality have also been found to relate to the racial diversity of an individual's social network. Lack of diversity is positively correlated with underestimation of the wealth divide between Black and White Americans (Kraus, Rucker, & Richeson, 2017), positive interaction with a dominant outgroup can increase support for meritocracy and decrease support for equity policy (Sengupta, & Sibley, 2013), and greater county-level inequality is associated with differential endorsement of meritocratic beliefs among low- and high-income people in line with their own personal experiences (Newman, Johnston, & Lown, 2015).

Public approval of policy to reduce socioeconomic inequality may therefore be influenced by public perception of societal inequity. Willingness to help an outgroup via policy may increase following a positive interaction, while lack of this interaction instead may encourage individuals to focus only on their experiences when making such judgments.

General Conclusions

Research in psychology has great potential to improve the effectiveness of social welfare policy because it reveals many possible targets for intervention, making it possible to develop a range of programs varying in scale and cost. Social safety net programs are not one-size-fits-all initiatives (especially in a country as large and diverse as the United States). Local, state, and federal funding for social welfare can fluctuate across time. The poor are not a class monolith, and anti-poverty policy that considers individual differences in the development of

interventions may therefore find more success for their budgets. Additionally, those who would benefit from policy directly are not the only ones whose behavior can influence its outcomes, and a fruitful future direction for psychological science is to elucidate the factors surrounding public support of social welfare programs. Measuring psychological variables can improve precision in predicting behavior, and better models of human behavior means more efficiency in developing and deploying programs to alleviate socioeconomic inequality. The previous section demonstrated this by discussing known weaknesses of existing policy, and psychological theories that offer explanations for why those weaknesses occur.

That the application of human-centered research to the development of programs which in-part attempt to influence human behavior has not been more frequently considered is surprising giving the obvious connection. Despite increasing calls to for psychologists to lend their expertise, addressing real-world issues of socioeconomic inequality has been relegated to the purview of other social and behavioral science traditions.

To-date, there is scant research in psychology on developing interventions to help people who are poor. The following study is included to illustrate how psychological factors identified in this dissertation can be targeted for interventions, and as an example of a potentially low-cost intervention program. DeHart, Friedel, Lown, & Odum (2016) targeted delay discounting in an intervention to improve financial decision-making, although it was using a student population. University students who self-selected to either a personal finance class or an abnormal psychology class were given a money temporal discounting task at the start and end of a semester. Results showed a reduction in delay discounting at the end of the term for the students in the personal finance course, but not in the psychology course. The authors conclude that a financial planning intervention could be used to push participants'

subjective valuation towards larger, later rewards. Such an intervention is not likely to be useful for people currently living in poverty, as their present-focused subjective valuation is most likely in response to very real threats to their survival. However, a financial education course may prove useful for those who have successfully mobilized into a higher class if they struggle with optimally managing their new relative wealth. Study of the behavior of the newly poor, or newly not-poor, is also a fruitful area for future psychological research.

As surely as man built systems to achieve previously-unimaginable feats like landing on the moon or nearly eradicating deadly viruses with vaccinations, so can we build social systems where malnutrition, homelessness, and distress are not *de facto* features of everyday life for millions of people. However, achieving this admittedly ambitious goal begins with a comprehensive understanding of a massive human issue. As Leser (1980) notes, "each consideration of the individual must also take the social perspective into account, and…a collective view of the historic process cannot altogether overlook the role of the individual" (p. 363). In other words, to pursue such an ambitious goal, study of the individual should be incorporated into study of the society – there is an exciting opportunity for psychologists to get involved in a fertile area of research, and one that comes with the bonus of extending work outside of the ivory tower to help disadvantaged people.

To that end, future scientific research on the topics of inequality and poverty conducted by psychologists could pivot more towards an applied focus and rely less on convenience samples or survey designs. Socioeconomic inequality is an issue that has, for millions, life-and-death consequences, and the severity of that will be inherently difficult to capture with laboratory manipulations. Given the challenges that existing policies face, it would be mutually beneficial for governments to partner with psychologists, as scientists who study people are uniquely positioned to examine the individual-level effects of socioeconomic

inequality and make valuable efforts towards improving lives.

APPENDIX A

STUDY TWO SCALE MEASURES

CITATION: The Planfulness Scale: Ludwig, Srivastava, and Berkman (2018).

INSTRUCTIONS: Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. Please respond according to the following scale.
1-Strongly disagree, 2-Disagree, 3-Neither disagree nor agree, 4-Agree, 5-Strongly agree

1) When planning ahead, I've tried to learn from mistakes that I've made in the past.
2) I often come up with unworkable plans. (R)
3) When I make decisions I primarily consider how I feel in the present moment. (R)
4) I prefer to take things as they come rather than set out with a specific plan of action. (R)
5) When I want to achieve something, I set goals.
6) When I stumble when I try to achieve something, it is difficult for me to get back on track. (R)
7) I have a good sense of how I can work towards my long-term goals in the present.
8) Developing a clear plan when I have a goal is important to me.
9) I think about my goal when I encounter obstacles to achieving it.
10) It is easy for me to lose track of long-term goals during my everyday routine. (R)
11) I spend very little time thinking about what my life will be in the future. (R)
12) Following a routine makes me feel stuck in a rut. (R)
13) I find it difficult to stick to my plans. (R)
14) I regularly spend time and energy now to get what I want in the future.
15) I achieve my goals by making steady progress
16) I am able to resist distractions when I am focused on a goal.
17) I think about specific ways that I can achieve my goals.
18) I prefer my days to be spontaneous rather than scheduled. (R)
19) I am able to perform tasks that I find difficult or uninteresting if they help me achieve my goals.
20) It is hard for me to focus in the present on a goal that I have in the future. (R)
21) Developing detailed plans is stressful for me. (R)
22) If focusing on a goal makes me feel overwhelmed, I tend to stop working towards that goal. (R)

23) I reflect on past experiences to better anticipate situations that will distract me from my goals.
24) It is easy for me to see how my everyday actions are linked to my goals for the future.
25) I prioritize my happiness now over my feelings in the future. (R)
26) I tend to take big projects and break them down into small pieces
27) I think of my actions today in terms of what they mean for tomorrow.
28) I can easily identify why I have not achieved goals in the past.
29) When it comes to achieving my goals, I think of any misstep as a failure. (R)
30) I do not spend much time thinking about my long-term goals. (R)

CITATION: The Big Five Inventory (BFI): John & Srivastava (1999)

INSTRUCTIONS: Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. 1- Disagree strongly, 2 - Disagree a little, 3 - Neither agree nor disagree, 4 - Agree a little, 5 – Agree strongly.

I see Myself as Someone Who…
1. Is talkative
2. Tends to find fault with others
3. Does a thorough job
4. Is depressed, blue
5. Is original, comes up with new ideas
6. Is reserved (R)
7. Is helpful and unselfish with others
8. Can be somewhat careless (R)
9. Is relaxed, handles stress well (R)
10. Is curious about many different things
11. Is full of energy
12. Starts quarrels with others (R)
13. Is a reliable worker
14. Can be tense
15. Is ingenious, a deep thinker
16. Generates a lot of enthusiasm
17. Has a forgiving nature
18. Tends to be disorganized (R)
19. Worries a lot
20. Has an active imagination
21. Tends to be quiet (R)
22. Is generally trusting

23. Tends to be lazy (R)
24. Is emotionally stable, not easily upset (R)
25. Is inventive
26. Has an assertive personality
27. Can be cold and aloof (R)
28. Perseveres until the task is finished
29. Can be moody
30. Values artistic, aesthetic experiences
31. Is sometimes shy, inhibited (R)
32. Is considerate and kind to almost everyone
33. Does things efficiently
34. Remains calm in tense situations (R)
35. Prefers work that is routine (R)
36. Is outgoing, sociable
37. Is sometimes rude to others (R)
38. Makes plans and follows through with them
39. Gets nervous easily
40. Likes to reflect, play with ideas
41. Has few artistic interests (R)
42. Likes to cooperate with others
43. Is easily distracted (R)
44. Is sophisticated in art, music, or literature

APPENDIX B

STUDY 2 PURCHASE CATEGORIES

Primary Category	Secondary Category	Discretionary
Housing	Mortgage	0
Housing	Rent	0
Housing	Property taxes	0
Housing	Household repairs	0
Housing	HOA fees	0
Transportation	Car payment	0
Transportation	Car warranty	0
Transportation	Gas	0
Transportation	Tires	0
Transportation	Maintenance or oil changes	0
Transportation	Parking fees	0
Transportation	Repairs	0
Transportation	Registration or DMV fees	0
Food	Groceries	0
Food	**Restaurants**	**1**
Food	Pet food	0
Utilities	Electricity	0
Utilities	Water	0
Utilities	Garbage	0
Utilities	Phones	0
Utilities	Cable	0
Utilities	Internet	0
Clothing	Adults' clothing	0
Clothing	Adults' shoes	0
Clothing	Childrens' clothing	0
Clothing	Childrens' shoes	0
Clothing	**Subscription services**	**1**
Medical/Healthcare	Primary care	0
Medical/Healthcare	Dental care	0
Medical/Healthcare	Specialty care (dermatologists, orthodontics, optometrists, etc.)	0
Medical/Healthcare	Urgent care	0
Medical/Healthcare	Medications	0
Medical/Healthcare	Medical devices	0
Insurance	Health insurance	0
Insurance	Homeowner's or renter's insurance	0

Insurance	Home warranty or protection plan	0
Insurance	Auto insurance	0
Insurance	Life insurance	0
Insurance	Disability insurance	0
Household items/Supplies	**Toiletries**	**1**
Household items/Supplies	**Cleaning supplies**	**1**
Household items/Supplies	**Décor**	**1**
Household items/Supplies	**Furniture**	**1**
Household items/Supplies	**Tools**	**1**
Personal	**Gym memberships**	**1**
Personal	**Haircuts**	**1**
Personal	**Salon services**	**1**
Personal	**Cosmetics**	**1**
Children	Babysitter services	0
Children	Diapers	0
Children	Toys	0
Children	Formula or baby food	0
Debt	Personal loans	0
Debt	Student loans	0
Debt	Credit cards	0
Financial planning	**Retirement**	**1**
Financial planning	**Investment**	**1**
Financial planning	**Savings**	**1**
Education	Tuition (your own)	0
Education	Tution (your dependent(s)')	0
Education	School supplies	0
Education	Textbooks or course materials	0
Gifts and Donations	**Birthday**	**1**
Gifts and Donations	**Anniversary**	**1**
Gifts and Donations	**Wedding**	**1**
Gifts and Donations	**Holidays**	**1**
Gifts and Donations	**Special occasion**	**1**

Gifts and Donations	**Charities**	**1**
Entertainment	**Alcohol and/or bars**	**1**
Entertainment	**Games**	**1**
Entertainment	**Movies**	**1**
Entertainment	**Concerts**	**1**
Entertainment	**Vacations**	**1**
Entertainment	**Subscription services (Netflix, Hulu, Amazon, etc.)**	**1**

REFERENCES CITED

Adamkovic, M., Martončik, M., Lačný, M., & Kačmárová, M. (2020, May 12). Poverty in behavioral research: Different operationalizations, different results. https://doi.org/10.31234/osf.io/4ek5y

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist*, *49*(1), 15.

Andreoni, J., Kuhn, M. A., & Sprenger, C. (2015). Measuring time preferences: A comparison ofexperimental methods. *Journal of Economic Behavior & Organization*, *116*, 451-464.

Becker, G. S., Kominers, S. D., Murphy, K. M., & Spenkuch, J. L. (2018). A theory of intergenerational mobility. *Journal of Political Economy*, *126*(S1), S7-S25.

Bialik, Kristen (October 6, 2017). Americans deepest in poverty lost more ground in 2016. https://www.pewresearch.org/fact-tank/2017/10/06/americans-deepest-in-poverty-lost-more-ground-in-2016/

Bickel, W. K., Johnson, M. W., Koffarnus, M. N., MacKillop, J., & Murphy, J. G. (2014). The behavioral economics of substance use disorders: reinforcement pathologies and their repair. *Annual review of clinical psychology*, *10*, 641-677.

Blank, R. M. (2005). Poverty, policy, and place: how poverty and policies to alleviate poverty are shaped by local characteristics. *International Regional Science Review*, *28*(4), 441–464. http://doi.org/10.1177/0160017605278999

Brooks-Gunn, J., Duncan, G., & Aber, J. L. (Eds.). (1997). *Neighborhood poverty: Policy implications in studying neighborhoods.* Russell Sage Foundation.

Brady, D., & Parolin, Z. (2020). Further Analyses Reinforce Our Conclusions About Extreme Poverty. *Demography*, *57*(6), 2369-2376.

Brulle, R. J., & Pellow, D. N. (2006). Environmental justice: human health and environmental inequalities. *Annu. Rev. Public Health*, *27*, 103-124.

Bullock, H. E., Williams, W. R., & Limbert, W. M. (2003). Predicting support for welfare policies: The impact of attributions and beliefs about inequality. *Journal of Poverty*, *7*(3), 35-56.

Bureau of Labor Statistics, U.S. Department of Labor (2020). Unemployment rate rises to record high 14.7 percent in April 2020. Retrieved April 15, 2021, from https://www.bls.gov/opub/ted/2020/unemployment-rate-rises-to-record-high-14-point-7-percent-in-april-2020.htm.

Burton, L. M., Mattingly, M., Pedroza, J., & Welsh, W. (2017). State of the union 2017: Poverty. Pathways: The Stanford Center on Poverty and Inequality Poverty and Inequality Report.

Carr, M., & Wiemers, E. E. (2016). The decline in lifetime earnings mobility in the US: Evidence from survey-linked administrative data. *Washington Center for Equitable Growth.*

Chapman, B. P., Fiscella, K., Duberstein, P., Coletta, M., & Kawachi, I. (2009). Can the influence of childhood socioeconomic status on men's and women's adult body mass be explained by adult socioeconomic status or personality? Findings from a national sample. *Health Psychology*, *28*(4), 419.

Chetty, R., Grusky, D., Hell, M., Hendren, N., Manduca, R., & Narang, J. (2017). The fading American dream: Trends in absolute income mobility since 1940. *Science, 356*(6336),398-406.

Chetty, R., & Hendren, N. (2015). The impacts of neighborhoods on intergenerational mobility: Childhood exposure effects and county-level estimates. *Harvard University and NBER*, 1-144.

Chetty, R., Hendren, N., Jones, M. R., & Porter, S. R. (2018). Race and economic opportunity in the United States. NBER Working Paper, (24441).

Cozzarelli, C., Tagler, M. J., & Wilkinson, A. V. (2002). Do middle-class students perceive poorwomen and poor men differently?. *Sex Roles*, *47*(11-12), 519-529.

Creamer, J. (2020). Inequalities persist despite decline in poverty for all major race and Hispanic origin groups. https://www.census.gov/library/stories/2020/09/poverty-rates-for-blacks-and-hispanics-reached-historic-lows-in-2019.html

Cunha, F., & Heckman, J. J. (2009). The economics and psychology of inequality and human development. *Journal of the European Economic Association*, *7*(2-3), 320-364.

Damian, R. I., Su, R., Shanahan, M., Trautwein, U., & Roberts, B. W. (2015). Can personality traits and intelligence compensate for background disadvantage? Predicting status attainment in adulthood. *Journal of personality and social psychology*, *109*(3), 473.

DeHart, W. B., Friedel, J. E., Lown, J. M., & Odum, A. L. (2016). The effects of financial education on impulsive decision making. *PLoS ONE*, *11*(7), 1–16. http://doi.org/10.1371/journal.pone.0159561

Diemer, M. A., Mistry, R. S., Wadsworth, M. E., López, I., & Reimers, F. (2013). Best practicesin conceptualizing and measuring social class in psychological research. *Analyses of Social Issues and Public Policy*, *13*(1), 77-113.

Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2017). Moving beyond correlations in assessing the consequences of poverty. *Annual review of psychology*, *68*, 413-434.

Evans, G. W., & Kantrowitz, E. (2002). Socioeconomic status and health: the potential role of environmental risk exposure. *Annual review of public health*, *23*(1), 303-331.

Evans, G. W., & Kim, P. (2007). Childhood poverty and health: Cumulative risk exposure and stress dysregulation. *Psychological Science*, *18*(11), 953-957.

Examining the Safety Net: Human Resources Subcommittee of the House Committee on Ways and Means (2015) (Testimony of Robert Greenstein). https://www.cbpp.org/research/poverty-and-inequality/examining-the-safety-net

Farrington, J., & Slater, R. (2006). Introduction: Cash transfers: Panacea for poverty reduction or money down the drain?. *Development Policy Review*, *24*(5), 499-511.

Federal Reserve Board, U.S. Department of Treasury (2021). Economic Well-Being of U.S. Households in 2020. Retrieved April 15, 2021, from https://www.federalreserve.gov/consumerscommunities/shed.htm

Frye, C. C., Galizio, A., Friedel, J. E., DeHart, B. W., & Odum, A. L. (2016). Measuring delay discounting in humans using an adjusting amount task. *Journal of visualized experiments:JoVE*, (107).

Furnham, A., & Gunter, B. (1984). Just world beliefs and attitudes towards the poor. *Britishjournal of social psychology*, *23* (3), 265-269.

Gennetian, L. A., & Shafir, E. (2015). The persistence of poverty in the context of financial instability: a behavioral perspective. *Journal of Policy Analysis and Management*, *34*(4), 904–936. http://doi.org/10.1002/pam

Ghatak, M. (2015). Theories of poverty traps and anti-poverty policies. *The World Bank Economic Review*, *29*(suppl_1), S77-S105.

Gould, J. M., & Marlin, A. T. (2019). *Quality of life in American neighborhoods: Levels of affluence, toxic waste, and cancer mortality in residential zip code areas.* Routledge.

Gregorich, S. E. (2006). Do Self-Report Instruments Allow Meaningful Comparisons Across Diverse Population Groups? Testing Measurement Invariance Using the ConfirmatoryFactor Analysis Framework. *Medical Care*, *44*, S78–S94. https://doi.org/10.1097/01.mlr.0000245454.12228.8f

Hamilton, K. R., & Potenza, M. N. (2012). Relations among delay discounting, addictions, andmoney mismanagement: Implications and future directions. *The American journal of drug and alcohol abuse*, *38*(1), 30-42.

Han, J., Meyer, B. D., & Sullivan, J. X. (2020). Income and Poverty in the COVID-19 Pandemic (No. w27729). National Bureau of Economic Research.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Beyond WEIRD: Towards a broad-basedbehavioral science. *Behavioral and Brain Sciences*, *33*(2-3), 111-135.

Higginbotham, E., & Weber, L. (1992). Moving up with kin and community: Upward social mobility for black and white women. *Gender & Society*, *6*(3), 416-440.

Hout, M. (2019). Social Mobility. Pathways, the Poverty and Inequality Report. Retrieved April 15, 2021, from https://inequality.stanford.edu/sites/default/files/Pathways_SOTU_2019_SocialMobility.pdf

Jacob, J. M. (2005). *Factors influencing hiring decisions for welfare recipients.* University of Rhode Island.

Jarrett, R. L. (1996). Welfare stigma among low-income, African American single mothers. *Family Relations*, 368-374.

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. Handbook of personality: *Theory and research*, *2*(1999), 102-138.

Kraus, M. W., Rucker, J. M., & Richeson, J. A. (2017). Americans misperceive racial economic equality. *Proceedings of the National Academy of Sciences*, *114*(39), 10324-10331.

Krieger, N., Williams, D. R., & Moss, N. E. (1997). Measuring social class in US public health research: concepts, methodologies, and guidelines. *Annual review of public health*, *18*(1), 341-378.

Lerner, M. J. (1980). The belief in a just world. In *The Belief in a just World* (pp. 9-30). Springer, Boston, MA.

Leser, N. (1980). Marx and Freud. ARSP: Archiv Für Rechts- Und Sozialphilosophie / *Archives for Philosophy of Law and Social Philosophy*, *66*(3), 363-390.

Liu, J., Raine, A., Venables, P. H., Dalais, C., & Mednick, S. A. (2003). Malnutrition at age 3 years and lower cognitive ability at age 11 years: independence from psychosocial adversity. *Archives of pediatrics & adolescent medicine*, *157*(6), 593-600.

Ludwig, R. M., Flournoy, J. C., & Berkman, E. T. (2019). Inequality in personality and temporal discounting across socioeconomic status? Assessing the evidence. *Journal of research in personality*, *81*, 79-87.

Ludwig, R. M., Srivastava, S., & Berkman, E. T. (2018). Planfulness: A process-focused construct of individual differences in goal achievement. *Collabra: Psychology*, *4*(1).

Lynch, J. W., Kaplan, G. A., & Shema, S. J. (1997). Cumulative impact of sustained economic hardship on physical, cognitive, psychological, and social functioning. *New England Journal of Medicine*, *337*(26), 1889-1895.

Lott, B. (2012). The social psychology of class and classism. *American Psychologist*, *67*(8), 650.

Mahoney, C. T., & Lawyer, S. R. (2016). Delay and probability discounting among payday and title loan recipients. *Behavioural processes*, *125*, 13-18.

Maloney, E. A., Sattizahn, J. R., & Beilock, S. L. (2014). Anxiety and cognition. Wiley Interdisciplinary Reviews: *Cognitive Science*, *5*(4), 403-411.

Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *Science*, *341*(6149), 976-980.

McCall, L., & Kenworthy, L. (2009). Americans' social policy preferences in the era of rising inequality. *Perspectives on Politics*, *7*(3), 459-484.

Meyer, B. D. & Wu, D. (2018). The Poverty Reduction of Social Security and Means-Tested Transfers. *ILR Review*, *71*(5), 1106-1153.

Miller, N. (2002). Personalization and the promise of contact theory. *Journal of Social Issues*.

Moffitt, R. (1983). An economic model of welfare stigma. *The American Economic Review*, *73*(5), 1023-1035.

Newman, B. J., Johnston, C. D., & Lown, P. L. (2015). False consciousness or class awareness? Local income inequality, personal economic position, and belief in American meritocracy. *American Journal of Political Science*, *59*(2), 326-340.

OECD (2018), Income inequality (indicator). doi: 10.1787/459aa7f1-en (Accessed on 02 May2018).

Parolin, Z., Curran, M., Matsudaira, J., Waldfogel, J., & Wimer, C. (2020). Monthly poverty rates in the United States during the COVID-19 pandemic. Center on Poverty and Social Policy at Columbia University.

Partridge, M. D. (2020). Rural America's stagnant economic performance: What's the role of declining dynamism? American Enterprise Institute.

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barrattimpulsiveness scale. *Journal of clinical psychology*, *51*(6), 768-774.

Peters, R. D., Petrunka, K., Khan, S., Howell-Moneta, A., Nelson, G., Pancer, S. M., & Loomis, C. (2016). Cost-savings analysis of the better beginnings, better futures community-based project for young children and their families: A 10-year follow-up. *Prevention Science*, *17*(2), 237-247.

Pew Research Center (April 11, 2019). Little Public Support for Reductions in Federal Spending. https://www.pewresearch.org/politics/2019/04/11/little-public-support-for-reductions-in-federal-spending/

Pluchino, A., Biondo, A. E., & Rapisarda, A. (2018). Talent versus luck: The role of randomness in success and failure. *Advances in Complex systems*, *21*(03n04), 1850014.

Powell, L. M., Slater, S., Mirtcheva, D., Bao, Y., & Chaloupka, F. J. (2007). Food store availability and neighborhood characteristics in the United States. *Preventive medicine*, *44*(3), 189-195.

R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: https://www.R- project.org/

Ravallion, M. (2011). On multidimensional indices of poverty. *The Journal of Economic Inequality*, *9*(2), 235-248.

Reiss, F. (2013). Socioeconomic inequalities and mental health problems in children and adolescents: a systematic review. *Social science and medicine*, *90*, 24-31.

Richards, J. B., Zhang, L., Mitchell, S. H., & Wit, H. (1999). Delay or probability discounting ina model of impulsive behavior: effect of alcohol. *Journal of the experimental analysis of behavior*, *71*(2), 121-143.

Runciman, W. G. (1966). *Relative deprivation and social justice*. London, UK: Routledge Kegan Paul.

Santiago, C. D., Wadsworth, M. E., & Stump, J. (2011). Socioeconomic status, neighborhood disadvantage, and poverty-related stress: Prospective effects on psychological syndromes among diverse low-income families. *Journal of Economic Psychology*, *32*(2), 218-230.

Schilbach, F., Schofield, H., & Mullainathan, S. (2016). The psychological lives of the poor. *American Economic Review*, *106*(5), 435-40.

Schmeer, K. K., & Yoon, A. (2016). Socioeconomic status inequalities in low-grade inflammation during childhood. *Archives of disease in childhood*, *101*(11), 1043-1047.

Semega, J. (2019). Pay is up. Poverty is down. How women are making strides. https://www.census.gov/library/stories/2019/09/payday-poverty-and-women.html

Sengupta, N. K., & Sibley, C. G. (2013). Perpetuating one's own disadvantage: Intergroup contact enables the ideological legitimation of inequality. *Personality and Social Psychology Bulletin*, *39*(11), 1391-1403.

Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, *338*(6107), 682-685.

Shariff, A. F., Wiwad, D., & Aknin, L. B. (2016). Income mobility breeds tolerance for income inequality: Cross-national and experimental evidence. *Perspectives on Psychological Science*, *11*(3), 373-380.

Sheehy-Skeffington, J., & Haushofer, J. (2014). Decision-making barriers and opportunities. *Barriers and opportunities at the base of the pyramid: The role of the private sector in inclusive development*, 111-125.

Shelton, J. E., & Wilson, G. (2009). Race, class, and the basis of group alignment: An analysis of support for redistributive policy among privileged blacks. *Sociological Perspectives*, *52*(3), 385-408.

Sidanius, J., Pratto, F., Martin, M., & Stallworth, L. M. (1991). Consensual racism and career track: Some implications of social dominance theory. *Political psychology*, 691-721.

Sweet, E., Kuzawa, C. W., & McDade, T. W. (2018). Short-term lending: Payday loans as risk factors for anxiety, inflammation and poor health. *SSM-population health*, *5*, 114-121.

Turner, J. C., & Oakes, P. J. (1986). The significance of the social identity concept for social psychology with reference to individualism, interactionism and social influence. *British Journal of Social Psychology*, *25*(3), 237-252.

U.S. Census Bureau (2017). The Supplemental Poverty Measure.

U.S. Census Bureau (2018). Income and poverty in the United States. Retrieved April 15, 2021, from https://www.census.gov/library/publications/2019/demo/p60-266.html#:~:text=The%202018%20real%20median%20earnings,different%20from%20the%202017%20ratio.

Varnum, M. E. (2013). What are lay theories of social class?. *PloS one*, *8*(7), e70589.

Weissman, J. S., Pratt, L. A., Miller, E. A., & Parker, J. D. (2015). Serious psychological distress among adults, United States, 2009-2013. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics.

.